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BETTER FRUIT

The Pioneer Horticultural Journal of the Pacific Northwest

JULY, 1922

Features In This Issue:

- Filbert Culture and Varieties
- Plans for Shippers' Convention
- Profits and Benefits of Thinning
- System of Wire Bracing for Trees
- Leaf-Roller in Neglected Orchards
- Effects of Cover Crops in the Orchard

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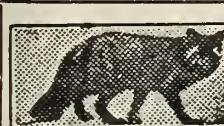
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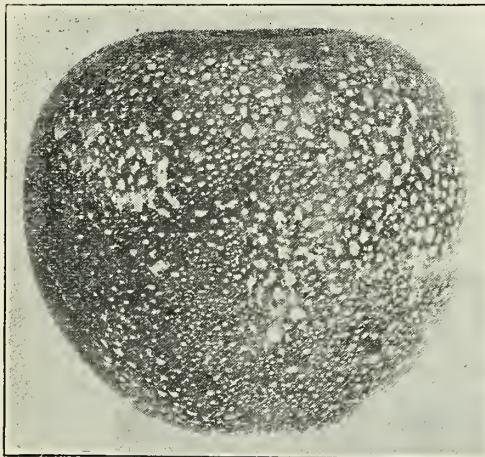
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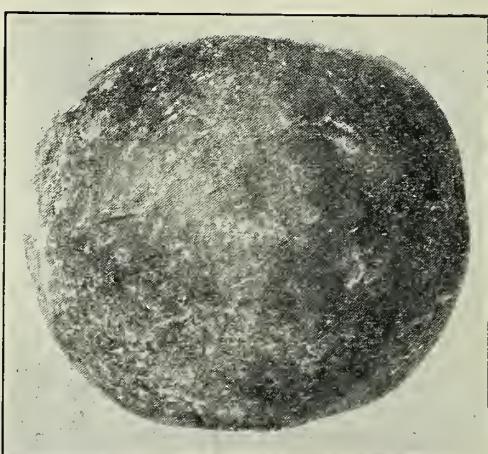
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BETTER FRUIT

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NUMBER 1

Profits and Benefits of Thinning

By ELWIN G. WOOD,

Extension Specialist in Horticulture, Washington State College, Pullman.

LITTLE experimental data is available regarding the value of thinning and none at all of recent date. Nevertheless, the practice of thinning fruit is far beyond the experimental stage and its value has long been recognized. While thinning alone cannot be depended upon to produce the maximum crops of large fruit of the highest grades, it is necessary in orchards that are in full bearing in the Northwest. The orchard management program aims at the maximum production of large fruit of the highest grade and it is my purpose to point out the influence and value of thinning in such a program.

Thinning helps to maintain the vitality of the tree, which in turn results in annual bearing. While thinning alone cannot increase the vigor of the tree it materially prevents wasting the vitality the tree already has. A young vigorous tree making a good average growth will come into full bearing and produce several good crops. Then it will overbear and lose in vigor and thus begin the habit of biennial bearing. Too great a portion of the tree's activity is consumed in the production of fruit buds and fruit at the expense of wood growth, and the tree loses in vigor so rapidly that it is only a step from biennial bearing to a condition in which the tree bears only an occasional crop of undersized fruit. Such trees can be brought back to normal bearing only by increasing the fertility of the soil, heavy pruning and heavy thinning.

On the other hand, if the crops are thinned every year, beginning when the trees first come into full bearing, they are never allowed to overbear and the biennial bearing habit is prevented. We are assuming, of course, that proper attention is given to pruning and to the maintenance of soil fertility.

Thinning in its relation to pruning deals with the individual fruit spurs of the tree, while pruning deals with the top and fruiting wood of the tree as a whole. Good pruning shortens the length of the branches and reduces the number of fruit spurs to such an extent that larger fruits are produced, but it cannot take the place of systematic hand thinning.

Brief mention has heretofore been made in these columns of the report of Mr. Wood on apple thinning tests and observations of last season. His study of the question brought out so pointedly the value of thinning—the actual resultant profit in dollars and cents—that our readers will want the full data he compiled. It has been held in reserve until its timeliness would make it doubly valuable. Please note that the value of the apples from a thinned tree was \$3.20 more than for those from the unthinned tree and that the net profit through thinning was \$2.70 per tree, or 540 per cent as based upon cost of the operation. Noting this, most readers will gladly study and put into practice the suggestions here given.

It is the normal tendency of a fruit spur to rest one year after bearing fruit. It is only spurs of exceptional vigor that will bear two years in succession. Systematic thinning leaves a large number of spurs well distributed throughout the tree to rest each year, and this greatly increases the likelihood of the tree producing a full crop the following year.

Again, if the trees are not pruned sufficiently to induce new wood growth and the production of new fruit spurs from year to year, the spurs may become too old and weak to produce good sized fruit even on alternate years, and in that case thinning may fail to keep the tree in heavy annual bearing. This serves to emphasize the fact that all of our orchard practices are so interrelated that we cannot neglect any one of them without its having an important bearing on the others.

TIME TO THIN—From these considerations we are able to see the importance of early thinning. The fruits should be removed before they begin to draw heavily on the food supply of the tree. Since an important factor is allowing a large propor-

tion of the spurs to rest in order that they may set vigorous blossom buds for the following year, it is important that the thinning be done early. This will give such spurs the entire summer to rest and get ready a vigorous blossom bud for the next spring.

Experimental data is lacking so we do not know just how early in the summer the differentiation between blossom buds and leaf buds takes place in the various sections. We do know, however, that the differentiation begins in the forepart of the summer and that the longer the apples are left on a spur before they are removed, the less likely that spur is to form a fruit bud for the next year. The best and most economical time to thin is just after the "June drop." At that time the thinning can be so thoroughly done that it will be unnecessary to go over the trees a second time except to pick off and destroy wormy apples.

No one will question that thinning increases materially the size of the fruit, but too many people have the erroneous idea that it is at the expense of the total yield. Relieved of the burden of producing such a large number of fruits, the tree has a surplus of food material. This nourishes the remaining fruits so well that they increase in size enough to bring the bulk of marketable fruit up to, and in many cases beyond, what it would have been had the tree not been thinned at all, or even poorly thinned. This is proved by observation and experimental data, and when the influence on annual bearing is considered, there is no doubt left but that for a period of years, other things being equal, a thinned tree will produce more extra fancy and fancy fruit than on unthinned tree of the same age and size growing beside it will produce of extra fancy, fancy, C grade, jumbies and culls.

It is also true that when only parts of a tree are heavily loaded the fruit will be small if not thinned. The fact that each large limb of a tree is more or less an individual unit in that respect was strikingly brought out in a demonstration at Prosser last summer. At a thinning demonstration

on July 11, one large limb of a heavily loaded Winesap tree was thinned to one apple on a spur and to a distance of eight or nine inches apart. At a cover crop demonstration in the same orchard on September 6, the crowd visited the tree to see the result. The rest of the tree had been lightly thinned and at a glance it could be seen that the apples on the well thinned limb were much larger than on the rest of the tree, even that early in the season. The demonstration clinched the argument for a group of nearly thirty men.

MORE EXTRA FANCY GRADE—The percentage of extra fancy grade is materially increased when the fruit is thinned to only one in a place. It prevents a great many blemishes caused by limb rubs, leaf scratches and the rubbing or pressing of the fruit together. This is especially true of pears. Last summer a high percentage of the low grade pears was due to this cause. In almost every place where the cheek of a pear pressed against another in the cluster there was a black spot sufficient in many cases to keep it from going into the fancy grade.

Fruit thinned to one in a place has a better chance to color up. The sunshine and air has a chance to reach the entire surface giving higher and more uniform color, and avoiding the uncolored spots resulting from one specimen shading another. Advantage in color is also secured by thinning the fruit heavier in the more densely shaded portions of the tree, and by thinning from the underside of the limbs, giving preference to the fruit that is more advantageously placed with reference to receiving sunshine. The same factors which increase the percentage of extra fancy reduce the percentage of C grade.

Thinning decreases materially the percentage of culls and jumbles. This must necessarily follow from the fact that it increases the size, reduces the blemishes resulting from limb rubs, and increases the color. Another important factor in reducing the culls is the assistance that thinning affords in the control of pests and disease.

With the fruit thinned to one in a place they are more easily completely covered with spray, giving a considerable advantage in the control of pests and disease, especially the codling moth. A second way in which the thinning may be made a help in the control of codling moth is by picking and destroying all wormy apples. This will certainly pay in reduction of the second brood.

There are fewer windfalls and the pickers drop fewer fruits from thinned trees than from unthinned trees. This is due largely to the fact that when one apple in a cluster loosens and falls, or when one apple in a cluster is picked, it allows the others to settle together or shift position on the spur. This causes the entire cluster to drop off. The pickers lose time in trying

to gather in whole clusters at once to prevent the remaining fruits from dropping.

Thinning prevents the breaking of many branches and limbs and makes propping unnecessary. This fact is so evident that it needs little comment. Broken limbs are a serious loss because they mean the loss of revenue from the product of those limbs for several years to come. When a limb breaks much of its fruit falls as a result and fruit below is also knocked off.

PICK PEARS EARLIER—In the case of pears, at least, thinning hastens the date at which they may be picked. Pears are not allowed to ripen on the tree and are usually picked as soon as they reach the desired size of 2 1-2 to 3 inches in diameter. Well thinned trees can often be picked from one to two weeks earlier than trees which were not thinned. This gives the grower the advantage of higher prices on an earlier market.

There is as much, or more, labor saved in picking, grading, and packing fruit from thinned trees as is used in thinning. Men like to handle large fruit and can pick, grade, or pack more boxes in a day. At a thinning demonstration in Wenatchee in the spring of 1921, a man told of a Jonathan orchard which had been thinned the year before with the exception of one small block. On the rest of his orchard, working with a Cutler grader, his crew were putting out 1200 packed boxes per day. On the part of his orchard which had been left unthinned the output was only 700 boxes. In other words, it required five-twelfths more labor to harvest and pack the unthinned portion of his orchard.

While the greatest value of thinning is in the effect on the present year's crop, it also increases the value of the orchard. Obviously, other things being equal, an orchard without broken limbs and bearing annually as a result of thinning is worth more than one which has not been so thinned. Thinning pays big dividends. When based on the cost of thinning it returns from five hundred to a thousand per cent. Bankers should learn to know the value of thinning. Then they would not refuse to lend growers the money with which to hire it done on the grounds that it is not a necessary operation or does not pay. A grower in Yakima told me that his banker laughed at him for wanting to borrow money with which to thin his crop.

VALUE DEMONSTRATED—In further proof of the value of thinning, let us consider some actual cases. The first is a record reported by Ray Thompson, local inspector at Grand View, Wash. According to Mr. Thompson's report, two Jonathan orchards of the same age growing side by side received the same treatment, in 1920, with the exception that one was well thinned and the other was not. The apples were all run through the same packing house, which afforded a careful check on

the grade and pack. The following figures were secured:

	Poorly Thinned	Well Thinned
	Orchard	Orchard
10 A.	12 A.	
Packed boxes	990	1000
Boxes of 4 1-2 tier and larger	675	990
Boxes of 5 tier	315	10
Boxes of jumble	298	0
Boxes Extra Fancy	465.3	730
Boxes Fancy	267.3	100
Boxes "C" Grade	257.4	170
Percent Extra Fancy	47	73
Percent Fancy	27	10
Percent "C" Grade	26	17

While the well thinned orchard was a little the larger and there may have been some unknown factors influencing the grade and size of the fruit, this is pretty good evidence of the value of good thinning.

The second instance is a demonstration carried out in 1921 in O. M. Melton's orchard in Fruitvale, at Yakima. Two sixteen year old Winesap trees, growing side by side on the same soil and receiving identically the same treatment in every respect, were selected for the demonstration. One was properly thinned and the other was left for a check. The thinning was done on July 6, a month too late for the best results. Nevertheless there was a striking contrast in the fruit on the two trees at harvest time. It took an hour and a quarter of a good thinner's time working rapidly to thin the tree. At 40c per hour this would cost 50c. The apples from the two trees were picked, graded, and packed separately on October 21, with the following results:

	Unthinned Tree	Thinned Tree
Boxes 4 1-2 tier	3.1	4.9
Boxes 5 tier	8.1	8.1
Boxes 5 1-2 tier	3.0	1.0
Boxes jumble	1.5	0.25
Boxes culls	1.5	0.25
Packed boxes	14.2	14.0
Loose boxes in field	20.0	18.0
Percent 4 1-2 tier	21.8	35.0
Percent 5 tier	57.0	57.8
Percent 5 1-2 tier	21.1	7.1
Percent jumble	8.8	1.7
Percent culls	8.8	1.7
Boxes Extra Fancy	8.6	10.8
Boxes Fancy	4.0	2.0
Boxes "C" Grade	1.6	1.2
Percent Extra Fancy	60.0	77.0
Percent Fancy	28.0	14.0
Percent "C" Grade	11.0	8.0

The percentage of culls and jumbles is figured on a basis of the total crop of the tree or 17.2 boxes for the unthinned tree and 14.5 boxes for the thinned tree, while the other percentages are figured on the basis of the saleable packed boxes or 14.2

(Continued on page 22)

System of Wire Bracing for Trees

By L. C. BARNARD,

Assistant in Pomology, College of Agriculture, University of California, Davis.

DURING the past few years the California Experiment Station has tested the use of wire braces as a substitute for wooden props to support the limbs of fruit trees. The efficiency of wire braces and the best method of applying them has been studied in the Experiment Station orchards and also in a number of commercial orchards, in co-operation with leading fruit growers. Wire braces have proven so satisfactory as to arouse widespread inquiry.

The tree is braced within by means of wires. Each limb is supported by a wire, one end of which is attached to the inner side of the limb by means of a screw-eye or staple. The other ends of these wires come together where they are attached to a single ring, in the center, at the proper height. Approximately 150 to 200 feet of wire should first be uncoiled along the row of trees to be wired, so as to be drawn toward the worker as he works from tree to tree. A small branch or weight should be attached to the farther end to prevent recoiling or kinking. On the other end is made a temporary hook which is fastened to any convenient twig in reach of the worker when on the ladder.

About a dozen washers or rings may be carried on a wire hook attached to the belt.



Demonstrating the strength of the wire bracing system, which is supporting the weight of the worker. He is sitting on the wires.

Pliers, staples, screw-eyes, hammer and awl should be accessible for rapid work. The operator is now ready to ascend the ladder which is set in the center of the tree.

MAIN LIMBS SELECTED—A screw-eye or staple is inserted on the inner side of each of the four or five main limbs. The smaller branches may in turn be wired to the main limbs.

The staple or screw-eye should be inserted at the proper height. If placed too low on the limb the latter may break above the support; if placed too far out on the limb there is a tendency to pull the ends of the branches in, giving the tree a bowed appearance.

An awl may be used to puncture the limb for insertion of the screw-eye. The screw-eye should be screwed down until its lower side just touches the bark and left parallel to the limb rather than crosswise, as this might cause restriction to the sap flow. This caution also applies to the position of staples when these are used.

After the screw-eyes are in place, the hooked end of the uncoiled wire is inserted through one of the eyes and securely twisted to prevent slipping or pulling out. The ordinary figure eight tie, as used on hay-balers, is recommended. After tying, the wire is drawn toward the center and cut at the desired length. From a screw-eye on the opposite side of the tree the same operation of wiring is repeated.

A washer, or harness ring, is next secured to one of the loose ends of the wire already fastened to the screw-eye. With this washer or ring in one hand the loose end of the second wire is directed through the washer or ring pulled taut and tied securely. The wires should not be pulled too tight or left too loose; they should simply take up the slack of the branches induced by gravity. The ring is now suspended in the center of the tree by the wires from opposite screw-eyes and it is an easy matter to attach the other wires.

NUMBER OF TREES PER DAY—The number of trees which may be wired in a day depends on age of the trees and whether staples or screw-eyes are used, more time being required to insert the latter. About 35 to 40 large peach trees were wired per day of nine hours.

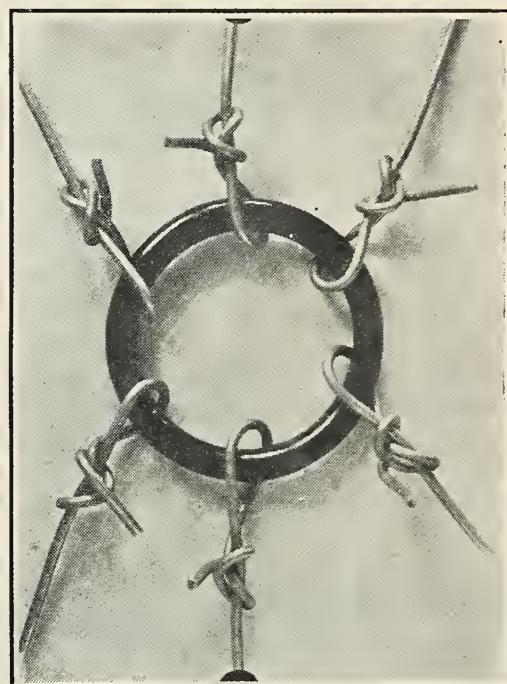
In one orchard of French prune trees twenty to thirty years old and heavily loaded, many so large as to require a double tier of wires, only 20 to 25 trees could be wired by two men, one man working in the center of the tree and the other around the outside.

TIME TO WIRE TREES—If wired while the crop is on the tree, the worker cannot

see so well; also there is some loss of leaves and fruit. However, the wood is soft and this makes the work with the screw-eyes or staples easier.

If wired in the fall, when the leaves are off, after pruning, the worker not only can see better, but also wires will not be placed on limbs which are apt to be pruned out later. At this season the limbs are in normal position and not weighed down with the fruit, necessitating propping before securing the wire to the ring.

The time of wiring may depend upon the individual grower's time, the condition of the tree, the urgent necessity of



This is the figure-8 tie used in attaching the wires to the center ring and also to the staples or screw-eyes.

propping, the number of props on hand for the season, cost of material and labor available.

Trees which are wired at an age of from four to eight years may at later intervals require additional wiring. If tall enough a second tier of wires is sometimes advantageous.

ADVANTAGES OF WIRE BRACING—Comparison of advantages of the wiring system will be grasped from the two following summaries:

WIRE BRACING

1. Practically permanent, lasting 20 to 30 years.
2. Cost of material for wiring a tree is comparatively cheap and the depreciation is very low.
3. Wiring can be done almost any season of the year.

4. Wire bracing does not interfere with tillage and is not effected by irrigation.

5. An orchard with trees centrally wired does not make an unattractive appearance.

6. With wire bracing the strain on any one limb is equally supported by all other limbs, and during wind storms the braces are secure.

7. Wire bracing does not interfere with harvesting.

WOODEN PROPS

1. Props usually last only from three to five years, and must be stored when not in use.

2. The cost of material for propping is very high and the depreciation much greater.

3. Wooden props are placed only during the fruiting season.

4. Wooden props are a great inconvenience in cultivating and often settle or fall during irrigation, allowing breakage of limbs.

5. An orchard with several thousand wooden props is unsightly.

6. Each limb is supported separately and is allowed to whip in the wind, props often being dislodged.

7. Wooden props are inconvenient in that a fruit picker must continually dodge them and pack his ladder around them; also they are in the way of the orchard truck.

COMPARATIVE COSTS—Assuming that an average size full bearing tree requires at least eight props and the minimum life of wire braces 20 years, as compared with three years for props, the comparative cost of bracing is as follows:

WIRE BRACING		
No. 14 gal. wire, 58 inches per lb.		
8 wires 5 in. long, 40 in. at .07	.05	
8 screw-eyes at .007	.05	
1 harness ring at .03	.03	
Cost per tree, 20-year period	\$0.13	

WOODEN PROPS

8 props, 1 x 2 inches x 10 feet at \$40 per thousand, equals 13.3 feet at .04 cents or \$.55 per tree. For a 20 year period the cost for wooden braces would be \$3.66 per tree.

Wooden propping is quicker to install than wire braces. The labor cost for a single season would therefore be less. However, over a twenty year period the accumulative cost would greatly exceed that of wiring.

The equipment necessary includes the following items: Ladders (small or large), hammer, pliers, staples of various sizes, screw-eyes, various sizes, $\frac{5}{8}$ -inch iron washers (inside diameter), $1\frac{1}{2}$ -inch japanned malleable iron harness rings, galvanized wire of various caliber, preferably No. 14.

HELPFUL HINTS—1. For convenient work the ladder should be set up in the center of the tree.

2. A tough leather glove worn on the hand used in twisting the wire is quite an advantage.

3. It is of less consequence getting the wires too high on the limbs than placing them too low. If placed too low breakage occurs above the screw-eye or staple.

4. Staples are quicker to install than screw-eyes. The ordinary barbed-wire staples are best for the main limbs. Do not use the small chicken wire staples for

the main limbs, as they will pull out.

5. After starting the screw-eye considerable speed can be attained by putting the point of the awl through the eye and using same as a lever to twist the screw-eye into place.

Test With Calipers

W. B. ARMSTRONG, Naches fruit grower and president of the Washington Farm Bureau federation, for several years has selected typical trees in various parts of his orchard and measured the growing apples regularly with calipers, setting the measurements and dates down in a book. Figures taken on the same limb of the same trees showed the fruit early in August this year larger than in September, 1920. The measurements also enable Mr. Armstrong to check up closely on irrigation, as lack of water stops the growth of the apples, and a sudden spurt in growth late in the season indicates that picking time is at hand. Records of the Big Y, of which Armstrong is a member, show that his apples rank high in size, quality and prices brought in the market.

Poison For Cutworms

ARTUR FRANK of the Western Washington Experiment Station, has worked out the following formula for a poison bait for cutworms, which every year give more or less trouble to truck gardeners:

Spread poison bait on ground made of 20 pounds of bran, one pound of Paris Green, two quarts of molasses or any syrup, the juice from three oranges or lemons and three and one-half gallons of water. Mix the dry bran and Paris Green. Squeeze the juices of the fruit into the water and then chop the peel into bits and add that to the water. Add the molasses to the water and wet the bran and poison with it. Stir to dampen thoroughly and to make just a moist but not a sloppy mash. Spread the poison bait on the ground either by broadcasting or placing in piles. The above quantity is sufficient for three acres and increasing or reducing the amounts in the same proportions will allow handling larger or smaller areas.

Dusting Roses

Roses should be dusted with fine dusting sulfur to keep rose mildew and other troubles in check. Those who purchase sulfur for this purpose should be sure not to accept merely a crude dusting powder, which is sulfur in its raw state, with little fungicidal or insecticidal value. A preparation of flowers of sulfur is what is recommended for this purpose.



By contrast note how unsightly the wooden props make the orchard, and also the large amount of land made unavailable for cultivation

Filbert Culture and Varieties

By C. A. READ,

Nut Culturist, United States Department of Agriculture

IN THAT portion of the Pacific Northwest between the Cascades on the east, the Coast Range on the west, middle Oregon on the south and the Canadian border on the north there is much land which appears to be well suited to filbert culture. Within this area there exists a wide range of conditions, some of which are more favorable to this species than others.

Very plainly, the high dry or gravelly soil should not be used for filbert planting. Neither should filberts be planted in soils deficient in fertility, nor in sites of poor drainage. Filberts will not succeed with constantly wet roots. In frost pockets, or in places from which the cold air cannot readily overflow to lower levels, there is danger to the catkins or pollen during severely cold spells. Fertile soils, deep to rock or gravel below, well drained, yet moderately moist and so situated as to not be unduly in danger of frost injury appear to be the best adapted to filbert culture.

The results obtained from some of the earlier filbert plantings in this section, both in way of yield and in character of product are encouraging to commercial planting. Today, there is a remarkably active demand for nursery trees for orchard planting. The pendulum of interest has temporarily at least, swung strongly to filberts for at least six reasons:

1. As a result of an unprecedented cold snap December 12 to 15, 1919, when temperatures in the Willamette Valley dropped to as low as—24 degrees Fahrenheit and many orchards of apples, prunes and walnuts in the lower lands, were so badly injured as to be killed outright, or to necessarily be cut down later, and when even oak, chestnut, hickory, wild hazel and many other trees and shrubs were severely hurt, it was found that the cultivated filberts were among the least injured. It was the exception rather than the rule that the filbert trees were seriously hurt. Usually the typical injury was confined to the destruction of staminate flowers above the snow line. True, there were exceptions in cases of trees somewhat devitalized because of recent heavy crops of nuts or other cause, or because of undue exposure as from being in a frost pocket.

2. The filbert is a rapid growing plant, quick to come into bearing, and, therefore, admirably adapted to garden culture.

3. The filbert is of minor importance in the United States outside of the Pacific Northwest. Competition of home-grown filberts, therefore, is exceedingly improbable in the near future.

4. Importers complain that filberts from

Nut growers of the Northwest were very much interested last fall in the visit to this section of Professor Read, considered the best authority in the United States on nut culture. At that time he was particularly interested in making a survey of the fast developing filbert industry. Before a great while he will publish a government bulletin on this industry. Before leaving this section he gave an illustrated lecture on filberts before the Western Nut Growers' Association in Portland. Subsequently he prepared the paper on this subject here presented and through courtesy of the association officers we are privileged to print it for the benefit of our wide-flung circle of readers.

foreign countries are rarely in good condition upon arrival here. A high proportion are either moldy in the center or ruined altogether; therefore, as a class, filbert importers are distinctly favorable to home production, provided, of course, that a product of good quality can be raised.

5. Filberts, in common with most nuts, (chestnuts excepted) are not quickly perishable, nor injured by rough handling.

6. More and more, the American people are eating nuts as staple articles of food.

Possible Danger—In the recent wave of enthusiasm, there is grave danger that planting may proceed too rapidly for safety. Inferior varieties may be put out, either as a result of ignorance on the part of the planter or plain fraud on the part of unscrupulous agents or nurserymen. The Western Nut Growers' Association would do well to arrange all of the available varieties into groups something as follows: Group A—Commercial sorts, those recommended for commercial planting. Group B—Promising sorts, those worthy of test planting and future observations. Group C—Pollenizers, varieties rated as good pollenizers for groups A and B. Group D—Doubtfuls, varieties not well known but which are regarded doubtfully. Group E—Discards or failures, varieties for which there seems no further use in testing.

The society should severely penalize any of its members, who as nurserymen, wilfully or otherwise, habitually sell trees untrue to name, particularly if seedlings are put out under variety names. It should go further; unless there are already ample laws in existence, it should exert its in-

fluence to have such laws enacted by the legislature as will provide equitable redress for those who have been victimized in this way.

The society should encourage the planting of few rather than many varieties in the orchards. It is probable that fewer than a half dozen varieties including the pollenizers are all that should go into any orchard of Oregon or Washington.

It may not be amiss to suggest that the formation of promotion companies for the purpose of developing large tracts of filbert orchards and sale to non-residents on the unit basis should be frowned upon. If the industry should prove to be a good thing, there are plenty of land owners already here to attend to development and sharing of the profits. Moreover, such development rarely works out to the advantage of the investor.

A maximum of 22 feet each way will probably be ample in any soil. Prospects are that when the matter of pruning becomes better understood, the trees will be so constantly cut back for renewal that at that distance the branches will never interlock. Twenty feet may not be too close but less than that certainly is not to be recommended at this time.

PROPAGATION—The propagation of filberts is comparatively simple, yet, the attending to all the details necessary to develop strictly first-class plants, and the production of enough plants to afford the selecting and planting of only the best, is a matter for skilled and well-equipped nurserymen, and not for amateurs. The sooner a few nursery concerns develop capacity for producing filbert trees of standard varieties, true to name and in considerable quantity, the better for the industry. The individual buyer cannot take time to investigate the standing of small nurserymen, or the fairness of their prices, or the value of the varieties they offer, or the promptness with which they can make shipment. The average buyer wishes to take a familiar catalog in hand and with a few minutes' study, to place his order for the varieties there recommended. Again, the better organized a propagating agency can be perfected, the less will be the unavoidable danger of confusion of stock or varieties.

Among the various methods of filbert propagation now employed, probably the simplest is that of allowing the plants to throw up suckers about the base of the tree and to separate these suckers from the parent plant. The development of roots along the sides of the shoot independent

(Continued on page 18)

Plans for Shippers' Convention

ONE OF THE most important events in years from the standpoint of apple men of the Pacific Northwest is the annual convention of the International Apple Shippers' Association, to be held in Seattle the twenty-fifth to twenty-eighth of this month. It will assemble a remarkable array of the big men of the whole country interested in the marketing of apples.

For many of these it will be the first trip to the boxed apple districts of the northwest. It is needless to point out that their visit will afford them many interesting observations and will, as well, give opportunity for the growers to impress them with the methods and facilities enabling our orchardists to produce the finest apples in the world.

There is evidence that the shippers of the east are keen to take advantage of the trip out here. A large attendance is expected. It is to be noted, however, that everyone connected with the apple trade has been invited, growers and dealers being particularly urged to join with the shippers at this convention. Persons outside the actual membership are expected to pay a registration fee of \$5, following established custom. This should be an indication that guests really have place in the convention. Headquarters will be at the Washington hotel.

Effort was made to obtain full details of the programme, but these have not come in time to go in this issue. To give as good an idea as possible of what has been planned we quote from the letter sent out to the trade—growers, shippers and dealers—by R. G. Phillips, secretary of the International. Text of the letter follows:

"The Twenty-seventh annual convention of the International Apple Shippers' Association will be held at the Washington Hotel, Seattle, Washington, July 25 to 29.

"We are earnestly hoping for and counting upon a splendid representation of our own members, and we urge as many as possible to be on hand. A cordial invitation is extended to members of all kindred trade organizations and everyone interested in the apple industry to meet with us. The time of your lives is assured. The ladies are thrice welcome and a special invitation is accorded them.

"Now is the time to make that long deferred trip to the coast. This is your golden opportunity. Do not waver, but make up your mind at once to take advantage of the low rates on the Chicago special.

"The Chicago special will pull out from that city on Tuesday, July 18, at 10:30 a. m., arriving at Seattle on Monday evening, the 24th. Tuesday, Wednesday, Thursday and Friday, July 25, 26, 27 and 28, will be devoted to business, interspersed

with enough pleasure to keep the mind alert and the spirit from flagging.

BUSINESS PROGRAM

Tuesday, July 25—Registration.

Wednesday, July 26—Opening session at 10:00 a. m.

Thursday, July 27—Business sessions all day.

Friday, July 28—Business sessions until 2:00 p. m.

Some of the finest talent and keenest intellects on the coast will address our meeting, and an intensely interesting and profitable convention is assured. Come to Seattle fired with "pep" and ardor and a determination to take an active part in the business sessions.

ENTERTAINMENT

All functions informal. Dress suits strictly forbidden.

Tuesday afternoon—Sight-seeing trip at 2:30.

Tuesday evening—Reception at Washington Hotel, dancing, entertainment, etc. An opportunity to meet old friends and acquaintances and to form new ties.

Wednesday afternoon—Special entertainment for all.

Wednesday Evening—"Pageant, "The Wayfarer.

Thursday—Entertainment for the ladies.

Thursday Evening—Annual Banquet.

"The entire Northwest will join hands for your entertainment, comfort, pleasure and happiness. Elaborate plans have been made. The great apple districts will welcome you. Special trips will be made following the convention. See America—a wonderful opportunity!"

Chairmen of the various committees having convention details in charge are: T. F. Ryan, reception; Herb Witherspoon, finance; E. A. Wanamaker, automobiles; A. B. Galloway, entertainment; P. H. Watt, banquet; J. C. Robinson, transportation; N. W. Mogge, publicity.

A big committee of men of the industry in the Northwest has been busy arranging for entertainment of the delegates. Every important apple growing district also has had a committee at work. The various districts have invited the delegates to visit their sections and such side-trips have been arranged. These will be beneficial in giving the shippers actual knowledge of the districts from which they receive the apples they handle.

Value of Oiled Wraps

RESULTS during 1921 in preventing apple scald in stored apples by the use of oiled-paper wrappers have confirmed all previous reports that the trouble may be controlled in this way if the oiled wrappers carry a sufficiently high percentage of oil.

The United States Department of Agriculture has recommended that the wrappers should carry 15 to 20 per cent of oil if they are to be effective in preventing the development of scald. When wrappers carrying a low proportion of oil, in some cases as low as 5 per cent, have been used poorer results have been obtained.

The demand for the right type of oiled wrapper for apples has been so great that many of the orders from growers have not been filled. About 80,000 boxes of apples were packed in oiled wrappers at Wenatchee, last season, and a similar number at Yakima.

Scald is a transportation and storage disease that is produced by gases given off by the apples themselves.

The disease is greatly favored by warm storage and by delays in reaching storage. It is particularly serious on the York Imperial, Grimes, Arkansas (Mammoth Black Twig), Rome Beauty, Rhode Island Greening, Stayman Winesap, Wagener, and Baldwin varieties.

In mild cases the apple is merely tinted with brown, but in more severe cases the entire skin layer is killed.

The disease looks like apple rot, but is rather a cause of rot. The gases which cause scald can be removed by ventilation or by absorbing them with oils.

Apples scald far less in boxes, crates or ventilated barrels than in the usual commercial barrels, but scald can be entirely prevented by storing the apples in oiled, not waxed wrappers.

This treatment has been found completely successful even when susceptible varieties have been placed in unventilated storage and held far beyond their usual storage season.

Gassing Moles

THE use of carbon bisulphide placed directly in the burrows of moles or other animals should not injure the roots of ordinary annual plants, says Dr. F. D. Heald, plant pathologist of the State College of Washington. But if these burrows happen to be close to any perennial plants with deeply penetrating roots, injury might result.

Carbon disulphide leaves an injurious effect on vegetation if applied in large quantities. For example, if 6½ ounces are put into three holes 16 inches from the main stock of a grapevine at a depth of 20 inches, it will result in the death of the vine.

A similar result can be expected in the case of trees or shrubs of almost any kind.

At Wenatchee, O. T. Clawson, formerly district horticultural inspector, performed the unusual feat of transplanting 28 full grown Delicious apple trees which he had to move in thinning and rearranging his orchard.

Effects of Cover Crops in the Orchard

By H. THORNBUR

Superintendent Montana Horticultural Substation, Victor

OUR EXPERIMENTS with cover crops in orchards were started in 1908, when the horticultural substation was established. The object was to determine the effect of different cultural practices, and find, if possible, some economical method whereby the fruit-grower might not only maintain but increase the fertility of his soil.

A five acre tract of land was divided into five one-acre plots and planted to McIntosh Red, Rome Beauty, Alexander and Wealthy apples. The arrangement was such that it gave one-fourth acre of each variety on each plot. Unfortunately fire blight destroyed the Alexander and Wealthy trees when young, hence we have only the McIntosh and Rome Beauty left.

In the beginning the plan was to intercrop plot 1 with a cultivated crop as potatoes; cover-crop plots 2 and 3 with clover, removing none of the growth from plot 2 and all of the growth from plot 3; cover-crop plot 4 with peas plowed under; and clean cultivate plot 5.

The following has been the treatment of the plots to date:

PLOT 1.

1908—Planted to potatoes.
1909—Planted to potatoes.
1910—Clean cultivated.
1911—Planted to potatoes.
1912—Planted to potatoes.
1913—Planted to potatoes.
1914—Clean cultivation.
1915—Seeded to alfalfa and plowed under in September.
1916—Clean cultivation.
1917—Seeded to clover.
1918—One cutting removed; second crop plowed under in September.
1919—Clean cultivation.
1920—Seeded to clover.
1921—One cutting removed; second crop plowed under in October.

PLOT 2.

1908—Clean cultivation.
1909—Seeded to clover; poor stand secured.
1910—Plowed under in early spring and clean cultivated during summer.
1911—Seeded to clover; one crop cut and left on ground.
1912—One crop cut and left on ground; second crop plowed under.
1913—Clean cultivation.
1914—Seeded to clover; one crop cut and left on ground.
1915—One crop cut and left on ground; second crop plowed under.
1916—Clean cultivation.
1917—Seeded to clover; one crop cut and left on ground.

Here is the third report Mr. Thornber has presented to readers of BETTER FRUIT, setting forth results of an important program of cover crop tests conducted under his direction. Each succeeding year the lessons of the experiment seem to have become more clearly defined. The case made out against clean cultivation might not be quite so unfavorable in all districts but is certainly such as to merit the attention of growers everywhere.

1918—One crop cut and left on ground; second crop plowed under.

1919—Clean cultivation.

1920—Seeded to clover; one crop cut and left on ground.

1921—One crop cut and left on ground; second crop plowed under.

PLOT 3.

1908—Clean cultivation.
1909—Seeded to clover; poor stand secured; one crop cut and removed.
1910—Plowed under in spring, and clean cultivated during summer.
1911—Seeded to clover. One crop cut and removed.
1912—Two crops cut and removed; plowed in fall.
1913—Clean cultivation.
1914—Seeded to clover; one crop cut and removed.
1915—Two crops cut and removed; plowed in fall.

1916—Clean cultivation.

1917—Seeded to clover; one crop cut and removed.

1918—Two crops cut and removed; plowed in fall.

1919—Clean cultivation.

1920—Seeded to clover; one crop cut and removed.

1921—Two crops cut and removed; plowed in fall.

PLOT 4.

1908—Clean cultivation.
1909—Seeded to peas.
1910—Growth of 1909 plowed under and clean cultivated during summer.
1911—Seeded to peas.
1912—Growth of 1911 plowed under in spring. Seeded to peas and plowed under again in August.
1913—Clean cultivation.
1914—Seeded to peas and plowed under in fall.
1915—Seeded to peas, and plowed under in fall.
1916—Clean cultivation.

1917—Seeded to peas and plowed under in fall.

1918—Seeded to peas and plowed under in fall.

1919—Clean cultivation.

1920—Seeded to peas and plowed under in fall.

1921—Seeded to peas and plowed under in fall.

PLOT 5.

1908 to 1916 inclusive, continuous clean cultivation.

1917—Seeded to peas, 16 loads manure added, all plowed under.

1918—Seeded to peas, 16 loads manure added, all plowed under.

1919—Clean cultivated.

1920—Seeded to peas, 16 loads manure added, all plowed under.

1921—Seeded to peas, 16 loads manure added, all plowed under.

AS WILL be noticed, plot 1 was changed in 1915 from potatoes to alfalfa, then, on account of the undesirable effect on the trees, to clover the following year with one cutting removed in contrast to plot 2 with no growth removed and plot 3 with all removed. Also, in 1916, clean cultivation was discontinued on plot 5 and peas with sixteen loads of manure per acre per year substituted. The reason for these two changes was that the trees on these two plots were beginning to show rosette. It was much worse on plot 5 than on plot 1, and a drastic change was necessary to save the trees.

Plots 2, 3 and 4 have been carried on as originally planned except that it was found necessary to clean cultivate one year out of three to control weed growth.

In Table No. 1 is a record of the growth of the trees showing the average diameter and height of the trees in the various stages of the experiment. From this table it will be noticed that with both varieties the greatest trunk and height growth was made on plots 1 and 2 throughout the experiment. On the other plots the diameter of trunk and the height varied considerably, without any definite relationship to cultural practices, and, as we shall find later, to yield.

The trunk diameter and height of individual trees on plots 3, 4 and 5 may nearly equal those of some of the individual trees in plots 1 and 2, but the spread of the branches of the former is often less than two-thirds the latter. One must really see the trees to appreciate the difference, not only in size but in color of bark and vigor. The trees on plots 1 and 2 are superior in every respect to those on the other plots.

However, the probable cause of the trees on plot 1 making the largest growth was the fact that with potatoes as an inter-crop they may have had more water than any other plot. With plot 2 the soil is really a little better than any of the other, and plot 5 being clean cultivated the moisture was conserved better than it could be on plots 2 3 or 4.

TABLE 3.

Showing average yields per tree during latter years of the experiment.—(Weights given in pounds.)

McIntosh Red			
Plot	1919	1920	1921
1	67	196	232
2	45	170	169
3	38	89	104
4	32	60	96
5	31	41	65
Rome Beauty			
1	28	94	92
2	31	97	67
3	27	62	67
4	26	17	43
5	5	6	24

From this table it would appear that the cultural methods employed on plot 1 are most desirable. It does not, however, follow that the increase in fruit production over plot 2 is caused by the removal of one-half of the clover growth. It is probably due to the fact, as previously stated, that the trees on plot 1 got the best start on account of receiving more water when intercropped with potatoes. At any rate

they did not have to compete with clover, and the potatoes were planted at least three feet from the trees.

Plot 3 shows definitely that the use of an orchard for the production of hay is not conducive to apple yield; plot 4 also indicates that peas do not compare favorably with clover as a cover crop, and plot 5 clearly demonstrates that clean cultivation long continued will permanently injure the trees.

AT THIS time it will be interesting to note that since clover has been used in plot 1, one cutting removed, the rosette has disappeared completely, and the use of manure and peas on plot 5 is also beneficial to the rosetted trees, as they are rapidly outgrowing their previous unsatisfactory condition. During the past three years the production of this plot has increased very satisfactorily.

From table No. 2 one can readily see what the difference in profits would have been if these five plots had represented five ten-acre orchard tracts owned by five different men. The men who removed all the clover growth as in plot 3, or used peas as a cover crop as in plot four would each have had about one-half as many apples as the man who followed the practices outlined in plots 1 and 2. What happened to the man who owned the imaginary ten-acre orchard handled like plot 5 in the beginning? Still there were many staunch advocates of clean cultivation when

this experiment was started. While plot 5 is coming back slowly as the tables and field observations show, it would have been otherwise than wise from a financial standpoint to attempt to renovate an orchard in the condition plot 5 was in, by 1917.

The orchardist interested in the complete history of this experiment is referred to the two previous papers on the same subject in the past two annual reports of the State Horticultural Society and published in the August numbers of BETTER FRUIT in 1920 and 1921, also to bulletin No. 114 of the Montana Experiment Station.

Fungous Diseases of Trees

By L. J. BARTHOLOMY

LARGE profits and a vigorous orchard are not possible when the trees are infested with fungous diseases. The horticulturist will be benefitted by having a knowledge of the life history of the parasitic fungi, experience in use of spray mixtures, a comprehension of general plant physiology, and an adequate conception of crop requirements. This makes possible a rational means of control in the majority of cases. General sanitation will greatly aid in keeping down attacks by fungi.

Certain varieties of fruits may be more resistant to certain prevalent fungi than others. Among the principal fungous diseases are brown rot, apple and pear scab, pear blight, and heart rot.

Brown rot does great damage among the stone fruits. It is serious in Oregon, especially after a rainy period near picking time. Fruits half size or larger seem to be the most susceptible.

In controlling the disease all of the "mummified fruits" should be destroyed in the fall. The disease varies so much with the weather that no fixed spray program can be advised. Plowing early and cultivating in the blossoming season will help to reduce early attacks. Rotted fruit on the ground at the close of the season should be cleaned up by hogs if possible. The orchard should be watched during the growing season in the case of prunes and peaches. Rotting fruit clusters should be picked out of the trees with pole hooks and removed. A spray of Bordeaux, 4-4-50, or self boiled lime sulfur, 8-8-50, given about a month before picking will reduce the serious harvest attacks considerably.

Pear blight, so called because it attacks pear trees the worst, also attacks apple trees, quinces, and other fruit trees. It is also known as fire blight, twig blight, blossom blight, and by similar names. It appears throughout the blossoming period, blighting the twigs and blossoms, which wilt and blacken. It spreads down the branches and water sprouts to the trunk and roots where

TABLE I
Showing Average Trunk Diameter and Height of Apple Trees Under Cover Crop Tests.

Plot	1914		MCINTOSH RED		1921	
	Diameter Inches	Height Feet	Diameter Inches	Height Feet	Diameter Inches	Height Feet
1	3.78	10.74	5.42	12.29	6.98	13.50
2	3.58	10.38	5.21	12.31	6.96	13.60
3	3.04	9.62	4.36	11.17	6.30	12.20
4	2.95	8.88	4.11	10.09	5.57	10.60
5	3.21	8.91	4.45	10.19	5.93	11.30
ROME BEAUTY						
Plot	1914		1917		1921	
	Diameter Inches	Height Feet	Diameter Inches	Height Feet	Diameter Inches	Height Feet
1	3.33	10.43	4.60	11.27	6.22	12.00
2	3.17	9.84	4.59	11.07	6.22	12.10
3	2.94	9.16	4.14	10.32	5.60	11.40
4	2.91	9.09	4.31	10.29	5.83	11.50
5	3.16	9.25	4.24	9.65	5.82	11.10

TABLE II
Showing Actual Total Yield Per Tree and Computed Yield Per Acre at 88 Trees Per Acre, 1912-1921 Inclusive

Plot	MCINTOSH RED		
	Yield Per Tree	Yield Per Acre	Plot Per Cent of Total
Plot 1	720	63,360	31.6
Plot 2	592	52,096	26.0
Plot 3	369	32,472	16.2
Plot 4	356	31,328	15.6
Plot 5	239	21,032	10.5
ROME BEAUTY			
Plot	Yield Per Tree	Yield Per Acre	Plot Per Cent of Total
Plot 1	305	26,840	29.0
Plot 2	305	26,840	29.0
Plot 3	244	21,472	23.2
Plot 4	142	12,496	13.5
Plot 5	55	4,840	5.2

body blight, collar rot, and root blight may develop with the most serious consequences.

Pear blight may be controlled or practically eradicated in large regions by thoroughly pruning out the blight infected twigs and branches and cutting out hold-over cankers and all diseased parts in the fall and winter. It is just as important to inspect the crown below ground for signs of root and trunk blight and any affected area should be entirely cut away.

The orchard must be gone over several times very thoroughly and carefully and a final observation made a short time before the opening of the blossoms. In the growing season, prune out all new cases. The pruning tools must be sterilized after each operation and the wound washed with the antiseptic.

Reimer's blight disinfectant is recommended as the best. The formula is one part by weight of corrosive sublimate, one part by weight of mercuric cyanide, and 500 parts by weight of water.

This solution is a deadly poison and should be so labeled and kept out of the reach of children. Do not keep in metal containers. Do not use it after it has become dirty.

HEART ROT fungi enter the tree through a wound or injury to the bark. The heart wood decays, weakening the tree, cutting the yield of fruit, and causing the limbs to split and break, thus ruining the tree. To prevent this, paint all new wounds occurring on the trees with Bordeaux paste, and also paint all the larger wounds made by pruning.

Apple scab is the most serious disease of the apple in Oregon. As it is carried over on the leaves of the season before it should be plowed under in the early spring before the winter buds burst if possible. In controlling it at least one spraying with lime sulfur 2-100—or self boiled lime-sulfur, 8-8-50, if burning is feared—before blossoming time is necessary. The second spraying should be immediately after the blossoms fall, and at least one more, two weeks after the second spraying. Conditions determine the length of time between and the number of applications.

When purchasing nursery stock it should be carefully examined for any fungous diseases and only vigorous, healthy stock bought. Extreme care and vigilance is necessary at all times to keep down the attacks of fungous diseases.

Oregon growers and cannerymen in territory tributary to the Southern Pacific railroad were pleased by a recent announcement of reduced rates on canned fruits, berries and vegetables. It was announced by J. H. Mulcahy, general freight agent, as the third reduction in rates and minimum weights "to assist the packing industries along the Southern Pacific lines."

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Leaf Roller in Neglected Orchards

By H. E. NEWMAN

Horticultural Inspector, Washington State Department of Agriculture

ONE OF THE most prominent entomologists on the Pacific Coast recently made the statement that, "The fruit tree leaf-roller gives promise of becoming one of the most serious insect pests of deciduous fruit trees in the northwest."

When we consider that in districts where the leaf-roller has developed into a major pest it is now costing more in spray material and cull fruit than the codling moth; that in a district like Hood River, Oregon, it has been able to withstand organized attacks for six years and still remain a serious problem; and that it is now reported from various parts of the Yakima Valley, Wenatchee, White Salmon and Walla Walla, Washington, we must conclude that the menace is one that demands attention.

Fruit growers in the lightly infested districts will do well to take their cue from Poor Richard and eliminate if possible, or at least postpone the time when the "pound of cure" will become necessary.

To growers in such districts, the history of the leaf-roller development in Spokane county, Washington, and the results of some investigations carried on there in leaf-roller control during the past season should prove of value. These results indicate that the ordinary codling moth sprays as used in most up-to-date orchards may be a factor in holding the leaf-roller in check if they are consistently applied to *all* orchards in the district.

In the experimental work in Spokane county last spring some interesting results were secured from the use of arsenate of lead. Laboratory tests conducted under controlled conditions proved that arsenate of lead in dosages of from 4 to 8 pounds to 100 gallons of water has an actual killing efficiency of over 90 per cent on larvae two or three days old. These tests, while they do not include the lead at strengths as ordinarily used for the codling moth, do show the value of the poison as a killing agent for the leaf-roller and add materially to the value of the data which follows.

In the Spokane Valley the leaf-roller developed into serious proportions in 1919. Previous to that year the pest had been present for at least 10 years as Dr. A. L. Melander reports receiving the characteristic egg-masses from here as early as 1909. Pioneer fruit growers in various parts of the valley also state that they have noticed the leaf-roller work on their fruit for many years, but they did not know what caused it and because the amount of damage was so small they paid little attention to it until 1919.

Locality	LEAF-ROLLER INJURED APPLES IN SPRAYED AND NEGLECTED ORCHARDS					
	No. Orchards	No. Boxes	Examined	Pct.	Injured Apples	
	Sprayed	Neglected	Sprayed	Neglected	Sprayed	Neglected
Pleasant Prairie and Green Bluff...	9	2	23	5	1.7	9.7
Orchard Bluff	3	1	8	2	1	22
Dennison and Deer Park.....	10	1	20	3	4.5	13

At this time it became serious simultaneously at Otis Orchards, Opportunity and East Farms, a territory over 10 miles in extent, and has so increased since then that it is at present the most dreaded insect all over the valley, though the degree of its seriousness varies in different localities, some districts still suffering only nominal losses.

NOW undoubtedly the pest has been slowly increasing and spreading here in orchards favorable for its development since it was first reported in 1909. If we trace the history of arsenate of lead spraying for the codling moth, we find data which at least makes interesting speculation. Until about 1917 the only lead spray applied in the Otis district as a whole was the calyx spray, and in many orchards even this was omitted. This would seem to be a very favorable condition for the development of a pest like the leaf-roller. In some districts it did not have more than one lead spray to contend with, and in a few orchards it had no opposition at all.

It is now too late to get enough definite and concise information to warrant the statement that the leaf-roller developed faster in neglected orchards here than it did in orchards which were well cared for. But in some of the smaller fruit districts of the county we find some valuable data. In these districts the leaf-roller now stands, probably, very much as it stood in the Spokane Valley during the years just previous to 1919. It is present in all of them from Deer Park to Waverly and can be found in practically every orchard. Many of the orchard owners do not know that they have it; those that do, pay little attention to it since it is causing but little damage.

Since no spraying for the leaf-roller has been attempted in these districts, the data of the accompanying table relative to the pest should merit careful consideration. The data was taken last fall at apple picking time. From one to four field-run boxes of apples were examined either in the field or at the packing shed in each orchard where data was taken, the orchards being chosen at random as well as the boxes to be examined.

Totalling these figures we find that the average neglected orchard in those districts where the leaf-roller is just getting a start showed a fruit injury last fall approxi-

mately six times greater than the orchards in the same localities which received the regular codling moth spray. This is good indication that the calyx spray and the first cover spray for the codling moth have been exerting a strong influence in these districts in holding the leaf-roller in check.

Whether or not the codling moth sprays at the ordinary strength will continue to hold them in check is a problem for the future. Probably the pest will slowly increase in spite of these sprays until eventually stronger dosages of lead, or an extra application in the pink spray when the eggs are hatching, or a dormant spray of oil will be required to keep it down. But whatever happens in the well sprayed orchards, we may be sure from the evidence presented that the pest will increase in the neglected orchard.

NOW IF occasional orchards scattered here and there in any district where the leaf-roller is establishing itself, or is apt to establish itself, are allowed to continue to lie neglected as many are at present, receiving no codling moth sprays at all, the result is not hard to foresee. These orchards will become leaf-roller breeding grounds from which sooner or later a whole neighborhood or possibly the whole district may become seriously infested.

The problem which the leaf-roller presents to every fruit district in the Northwest is this: What are you going to do about your neglected orchards? Are you going to apply the ounce of prevention while you still have the chance, or will you wait as Hood River and Spokane did and then apply the pound of cure, year after year at tremendous expense?

The answer should be prompt and decisive. The neglected orchard is as great a menace as the pests it harbors and should be given the same kind of treatment. If it is not worth while to enforce the codling moth sprays for the control of the codling moth alone, the leaf-roller menace certainly gives the added incentive which makes enforcement of these sprays of prime importance.

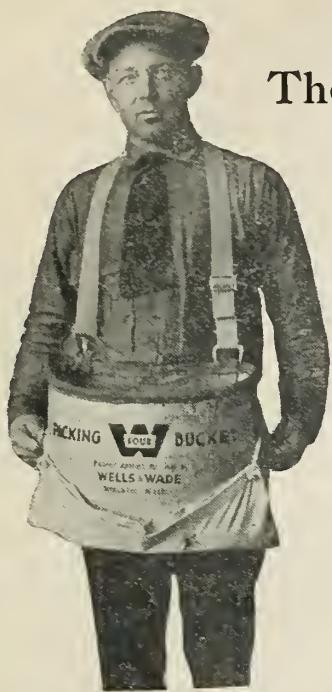
Fire destroyed the main office and storage building of the Wenatchee Produce Company June 13. The loss was about \$125,000, fully covered by insurance. Rebuilding is being started at once.

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Gentlemen:

During the 1921 fruit season we purchased and used approximately two hundred fifty of your "4W" Picking Buckets. The bucket has proven a big success in our orchards, practically eliminating stem punctures from our fruit. It would be very hard to induce this organization to go back to the old system of picking with canvas bags.

It is impossible to estimate the saving made by the use of the Wells & Wade Bucket—but I am confident that in our orchards we have been able to market several thousand more boxes of apples because of having used the buckets, than we would have marketed if we had used canvas picking bags.

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(Signed) By Earl Barnhill,
Regional Supervisor.



"Better Than Bags"

Peshastin, Wash., Oct. 21, 1921
WELLS & WADE,
Wenatchee, Washington.

Gentlemen:

There were 40,000 boxes of apples picked in "4W" Picking Buckets on this tract this season—and I can say that this bucket has given entire satisfaction. Growers who have used the "bags" in years past have found that at least 15 per cent of the fruit picked in bags have been "cul's," from bruises and stem punctures. This is a HEAVY LOSS to any grower. After using the "4W" Picking Bucket a full season, I can safely say that I have not had 1 per cent loss in bruised or stem-punctured apples—and this applies equally well to all varieties of tree fruit. Furthermore, I have not had a single apple-picker want to change one of these buckets for a bag.

Yours very truly,
(Signed) CHARLES LINVILLE.
Manager Peshastin Orchard,
Peshastin, Washington.

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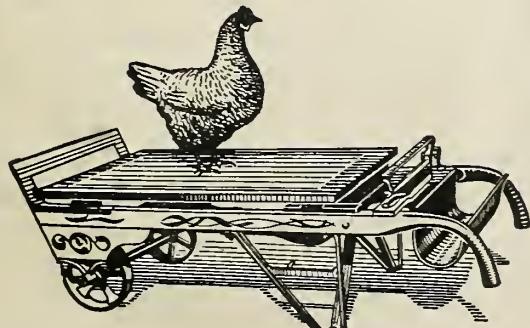
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VOL XVII, NO. 1

Shippers' Convention

For the fruit man of the Northwest there attaches to the coming convention this month of the International Apple Shippers' Association in Seattle both a duty and a privilege—more properly in the plural, duties and privileges.

BETTER FRUIT is not much worried about the duties to afford enjoyable entertainment to the delegates that devolve upon the growers and shippers of this section. Long ago the various districts began vying with each other for the chance to entertain the visitors. This, in itself, is being counted a privilege. There is no longer any doubt that the big men of the East who attend the convention will be shown a good time—as many good times as they may relish.

It would impugn the intelligence of our clientele to suggest that they may not comprehend the value of the opportunity and privilege of meeting these shippers and showing them at first hand just where and how the fruits they handle are grown. There are certain to

be mutual benefits in these contacts.

The place to make these personal contacts will be at the convention. This leads us to emphasis on the privilege our growers have of attending the convention. According to all announcements and the whole spirit of the affair there can be no doubt that every grower and shipper of the Northwest will find warm welcome at the meetings. As we understand it, no one need hesitate about going to Seattle because he is not a member of the association.

The dates of the convention are July 25-29. Lay your plans so you may attend. Do not get the idea it will be sufficient for you to greet those of the shippers who may visit your home district. This will certainly lead to disappointments.

They want you at the convention and are expecting hundreds of you to be on hand. As an hospitable western host you surely are going to play the part properly from start to finish.

Tariff Demands

It is charged that "during the time foreign potash could not be obtained, potash sold at more than ten times the pre-war or present prices." American producers took advantage of the situation to do some effective profiteering, it is declared.

These assertions have been evoked in the fight in congress for a duty of 100 per cent on potash imports. Accuracy of the charges has not been checked up, but manifestly has a basis in fact.

It is true that fertilizer interests have been hard hit by the collapse of war prosperity. Whether or not they have accumulated such extensive profits while importations were virtually shut off that they now have no right to complain about lean years may even be beside the question.

One thing is certain and that is that they are utterly selfish in demanding a tariff duty of 100 per cent. We have not noticed a disposition to fix any such high duties

on farm products. Farmers and fruit men well know what the imposing of such a duty would do to the cost of potash. The way to swat this demand is through our representatives in congress.

Home Orchards

In 1909 the state of Missouri had 14,359,673 bearing apple trees. Ten years later in 1919, it had but 5,162,859. The loss of 9,196,814 trees during the decade amounted to 64 per cent.

Other states of the Middle West have experienced a similar shrinkage in number of apple trees, though figures for Missouri probably represent the maximum decrease.

Just now there are under way rather energetic campaigns to bring back the family orchard in many of those eastern states. Farmers are being urged to plant family orchards. The nurserymen are a powerful factor back of these campaigns, for reasons not entirely unselfish. Some results will be accomplished—just how extensive remains to be seen.

Whether or not the family orchards "come back" has no vital import to the northwestern grower of boxed apples. In one way, however, the situation touches his interests. It is just one more warning that he must stick to his particular field—that of growing and marketing a select product.

Not long ago one of our contributors soundly criticised those growers—he was talking particularly of the Willamette valley—who are content to pack out what he termed "junk." He expressed the wish that such would-be orchardists might be legislated out of business by law. There is ample evidence that they are a detriment and a bad example in the industry.

This is not the time, nor will the time ever come, when apple growers of the Pacific Northwest can afford to let down their standards and send out anything but the superior packs of fruit which have won them both recognition and a market field of their own.

Getting the Gopher

By LUKE POWELL,
Consulting Horticulturist, Yakima, Wash.

IT IS SAD, but nevertheless true, that many of us orchardists have to suffer a financial loss from orchard diseases or pests before we begin a real aggressive fight to protect our interests.

The average rancher knows that the gopher eats more or less of the tree roots and is a serious, economic problem during the irrigation season. If these were all they would be small items compared to losses of from \$500 to \$1000 per year I have known good ranchers to suffer.

From the burrows beneath the trees the gopher is often driven out by the irrigation water and leaves a blind hole or burrow without an outlet. Water that finds its way into this burrow runs to the blind end and begins to soak out and forms a mud hole or underground pond under the trees in which the tree roots are immersed. If this condition continues for any length of time the roots become water-soaked and usually one season of this drowns the tree.

So far as the surface soil around the tree would indicate, it is no different from other trees in the same row, not affected. However, when the foliage of the tree begins to tell the story that something is wrong investigation with the soil auger or shovel shows the tree roots standing in water or mud and the source of the trouble is traced to the gopher hole.

Trap, poison and destroy the gophers. The gopher is a solitary animal, with seldom more than one in a burrow. During the fall they are very active, due to the young striking out for themselves.

The McAbee trap is one of the best. Open up the fresh mounds, find the burrow, widen the sides of it so the trap can be pushed back into it. Leave the hole open so the light shines in. The gopher being a nocturnal animal soon proceeds to shut out the light and is caught in the jaws of the trap.

Poisoning is very simple. Mix one-eighth ounce strychnine alkaloid and one ounce saccharine, and put in a shaker. Take sliced carrots or parsnips and sprinkle with the poison. Open up the runaways and put a slice or two in, then close them again. The gopher and poison will do the rest. This method should get 90 per cent of the gophers.

The price of raising fruit is eternal vigilance.

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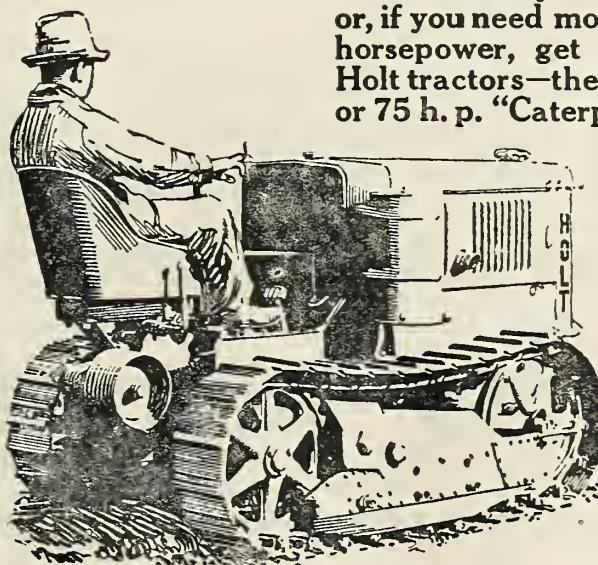
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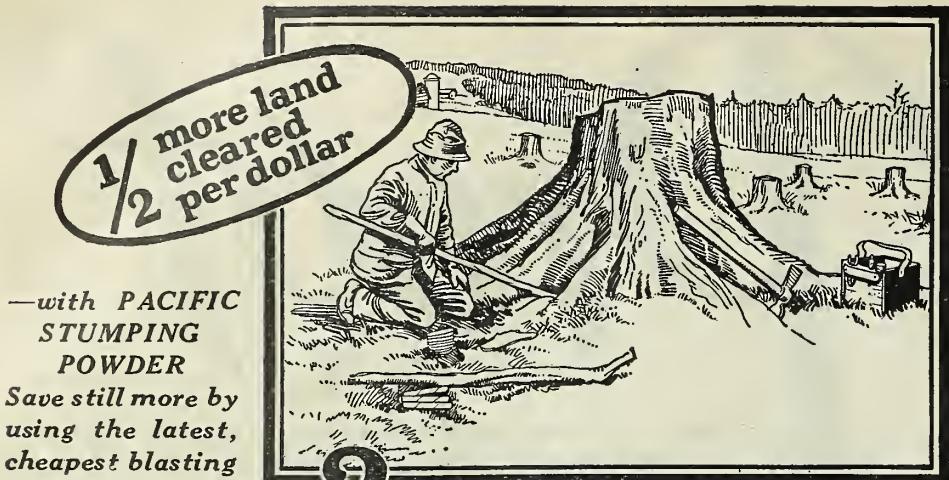
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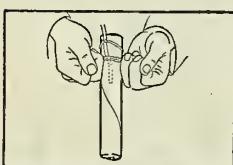


3

Filling and Tamping the Hole



1 Making the Hole



2 Cartridge Prepared and Ready to Load

AFTER the hole has been made under the stump and the charge properly primed and loaded, the next step is filling and tamping the hole. The purpose of this is to seal the hole tightly so that the gases from the explosion will not escape, but will exert all their pressure against the stump. The success of the shot depends very largely on careful and thorough tamping.

Moist clay, free from gravel and stones, fine sand or moist loam, makes excellent tamping material.

First, fill up four or five inches of the hole with this substance, and tamp it down gently with a rake handle with end sawed off square, or similar tamping stick. Then continue to fill the hole, tamping more firmly until the top is reached, and the passage securely sealed.

Stump blasting has become a cheaper operation since the development of Pacific Stumping Powder. You get $\frac{1}{2}$ more sticks per dollar and each $1\frac{1}{4} \times 8$ inch stick will do the work of a $1\frac{3}{8} \times 8$ inch stick of any standard stumping powder.

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Filbert Culture and Varieties

(Continued from page 9)

of the main root system of the mother plant is stimulated by mounding with earth. When ready for removal, the suckers with their individual roots are shaved off slightly below the original level of the surface. This system has its objections in that both sucker and parent plant are necessarily injured in the separation process, and that but one plant can be had per sucker.

According to English writers, filberts in Europe are sometimes propagated by cuttings, but in this country that method has not been found practicable, although it may have its possibilities.

The most commonly successful method employed in this country is that of layering by some of several methods. An old one is that of tip layering the new shoots in late spring or in summer, leaving the end of the shoot uncovered and in an upright position. To assure vertical growth, this end is frequently bent abruptly and secured to a stake. A fine appearing lateral root system usually develops quickly.

By still another method, suckers one year old or more, which have developed several branches each are layered in August and the tips of each terminal allowed to protrude above ground. They are left for more than a full year before being ready to take up, separate and transplant. In addition to necessitating an extra year to develop the plants by this method an infinite amount of painstaking labor and patience is required during the second year in the keeping down of weeds and in constant hoeing.

A method, which is one of the most simple, if not one of the most generally satisfactory, is that of layering one year shoots with no branches but with cut tips, either late in winter or early spring. The bark of the shoots is pared off on the face side and the shoots cut about half off near the base in order to permit them to bend abruptly and to lie closely to the ground. They are securely pegged down, but not covered until three or four inches of up-buds. At the end of the season the layers are taken up, cut up into separate plants, and placed in nursery rows for another year's growth.

SUCKERLESS TREES—Experience has demonstrated that trees trained to single stems, in addition to being easier to handle and care for are less inclined to be non-productive than if grown in clusters, or stools, as they are thus called. Some varieties are more inclined to sucker than others, but none can be left to themselves, if suckerless trees are wanted. To A. M. Gray of Milwaukie, Oregon, belongs the credit for having conceived of a tree so propagated and transplanted as to be nearly, if not wholly suckerless.

Briefly, his tree is so propagated that there is a minimum of the original layer attached to the plant when ready for transplanting. The new plant is so set that about three inches of its root system is exposed above ground. For a year, a mound of earth is maintained about the trunk so as to cover these roots, after which it is removed. By that time, the roots above ground are expected to have become so solid as to firmly hold the tree. Mr. Gray's logic does not seem unreasonable especially as with most varieties suckers rarely form except at the collar, or at the point where the trunk of the tree comes in contact with the soil. If a tree can be so grown and planted that the trunk will not come into contact with the soil, it will not be difficult to imagine a suckerless tree. If successful the discovery will prove of far reaching benefit to the industry.

VARIETIES—Some of the desirable points in a good variety are:

1. It must be a good annual bearer.
2. The nuts must be well filled and of sufficient size to be attractive to the eye. They should not be overly-large nor should the variety be overly-productive.
3. The nuts should drop freely from the tree.
4. Until husking machinery shall have been devised, the nuts should separate themselves readily from the husk.
5. The variety should not be especially subject to attack by serious insect pest or fungus disease.
6. It should be either self-fertile or fertile with pollen from one or more other readily available varieties.
7. It should have a prolonged blossoming period capable of extending itself for nearly a month.
8. It should ripen in normal years between the first of September and the middle of October.

(To be continued next month)

What of Water Sprouts

WATER sprouts indicate a disturbed equilibrium, an unbalanced condition of the tree; and are the result of an over stimulation, usually due to excessive pruning on vigorous trees. Unless the root force is in excess of the top, water sprouts cannot arise.

A water sprout or sucker is not only an unproductive parasite but a robber. Its leaf surface is usually insufficient for its own needs and it appropriates elaborated food from other branches.

To counteract this unbalanced condition, prune as sparingly as possible and entirely in summer. In case sucker growth is very heavy some may be tipped back, as it would not be safe to remove all without further unbalanced the tree. By persistent tipping back, a sucker may be brought into a

fair state of productivity, but it will always tend more toward wood growth and it is undesirable.

Renovating Old Orchards—By judicious pruning many old and neglected orchards may be brought back into profitable bearing, although not to as high a standard as had it received proper care during its entire growth. Most old orchards are headed entirely too high, and the hardest problem is to bring their fruiting wood within reach. The usual procedure in most cases is to head back the top severely and preserve as much of the lower wood as possible. Tipping water sprouts that may form low on the trunk is a means of securing new wood lower down.

Keep the general principles in mind; top back, open up the center, remove dead, crossed and crowding branches, and superficial growth. It would usually be impossible to remove the amount of wood necessary to properly prune an old neglected tree at one pruning without seriously unbalancing the tree and causing a heavy growth of water sprouts. It takes two or three years, removing part each summer.

By plowing the orchard very deep, one foot or more, with a sharp steel plow many surface roots and feeders will be cut off and much heavier pruning may be done without danger of unbalancing the tree.

Where the fruiting wood is beyond reach or badly formed it is advisable to cut the tree in winter twelve or fifteen inches from the ground and form a new head on a water sprout which may spring from the old stump. Where the scaffold branches have issued reasonably low, cut back three to five of those most suitably located to stubs on which to build the head. In removing the remaining branches leave one until the following winter. This will insure growth and keep the root system active as well as distribute the stimulating effect.

When cutting to a stump there are no live buds to start growth, and the tree must develop and force out advantageous buds before growth can start. The result is that the tree is less liable to live and the root system receives a severe check from lack of nutrition. This danger is materially lessened where the tree has been pruned severely the previous winter and water sprouts forced along the trunk below where it is to be cut.

Unless the tree is not too old and the root system and trunk are unsound it is better to renovate than to replant as a larger bearing tree can be secured in a much shorter time.

The Northwestern Association of Entomologists, Plant Pathologists and Horticulturists is to meet at Yakima, Wash., August 14. Delegates are expected from Colorado, Idaho, Utah, Oregon, Washington, California, Montana and British Columbia.

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Pears and all other fruits

Exclusive Distributors for

Dufur Orchards Co.,
Dufur, Oregon, 2000 acres

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This institution offers a thorough, practical, and standard education at a cost within reach of the high school graduate.

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It offers training also in
 The school of Music, Physical Education, Industrial Journalism.

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For circulars of information and illustrated booklets, write to

The Registrar,
 Oregon Agricultural College
 Corvallis, Oregon.

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GET OUR SAMPLES
 AND PRICES

WE CAN FILL YOUR
 ORDER FOR STOCK
 APPLE, PEAR, CHERRY
 AND STRAWBERRY LABELS
 IN 24 HOURS.

Renewal of Old Peach Trees

(Reprint from *Pacific Rural Press*)

THE common opinion that a run-down peach orchard cannot be brought back seems based on the practice of wrong methods, for examples can be found where orchards have been brought back, perhaps not to as fine a condition as trees handled rightly from the start, but to very good condition just the same.

The orchard of the Visalia Fruit & Land Company in Tulare county California, is an example. This is now 28 years old. Root-knot is beginning to get the better of it, but it is mostly good to look at even yet and very profitable. Twelve years ago it was unprofitable and in bad condition. At that time S. A. Hogan, who is still manager, was given charge, with instructions to bring it back if he could.

The trees had grown away out of reach and there was no fruit wood to speak of on the lower part of the branches. The fruit up on top was small and expensive to harvest.

The first thing done was to put a bunch of men in with saws and eight-foot ladders and they cut off the branches at about the level of the top of the ladders, also removing the older side branches of these leaders. An experienced fruit man going over the orchard said he would not give ten cents an acre for it.

That summer the orchard was carefully suckered. Vigorous growth came out all along the leaders and what was not wanted was rubbed off before it got big enough to rob the tree. The rest of the suckers were pinched back when they reached the right size, to prevent them from overgrowing and to make them store up food for the tree. This suckering cost 20 cents per tree on wages of 11 years ago. This system caused growth of the right size and shape to develop the first season. Consequently a fair crop was obtained the year afterward and in the year following that an immense crop was harvested. The only loss was the first summer's crop, and there were no peaches at all then.

TIME TO CUT BACK

An important feature in this renovation is the time of cutting back. Large wounds decay easily. Mr. Hogan waited until the sap had begun to flow before doing the cutting. After that the sap kept the wounds moist and a light painting prevented infection, with the result that the wounds healed over altogether. At present all that can be seen is a slight swelling at those points.

Another important matter was root pruning. The ground was plowed 10 inches deep that spring. When the plow came within 5 feet of the tree two furrows were run 10 inches deeper, pruning off the roots and doing for them what had been done on the branches. Both roots

and tops were in that way renewed at the same time.

Renewing the top, pruning the roots by deep plowing, and caring for the sucker growth made a new orchard. Two years ago the blight hurt the trees a great deal and last year the frost reduced the crop. Otherwise each year there has been a heavy crop except when frost limited it, and even last year the orchard averaged 8 3/4 tons per acre.

The trees are mainly Phillips and Orange Clings. The orchard is on rich bottom land. It is nearly twice the age of 15 years, which is commonly stated to be the life of a peach orchard and although the black-knot is reducing the vigor of many trees, the orchard promises to be very profitable for some time to come.

Making Vinegar

Many farmers have been unable to make a satisfactory grade of vinegar from their cull fruit. The fruit should first be washed free from dirt and all rotten or decaying material cast out before grinding.

The fresh cider should be stored in barrels or earthenware receptacles and kept in a room at a temperature of about 70 degrees to 75 degrees. If properly inoculated with a vinegar culture the first process of fermentation will go forward rapidly, and as soon as completed should be followed by the second process which makes the acid of the vinegar. This second process can also be best started by a vinegar culture.

These cultures may be obtained in this state from the division of bacteriology of the Agricultural Experiment station of the college for 50 cents a package, enough to make a barrel of vinegar. Each package contains directions for its use.

Vinegar now sells for 25 to 60 cents a gallon, according to grade and locality. An abundant supply for home use can be made at very small cost. If carefully handled the home-made vinegar will pass inspection and may be placed on the market.

There are government positions open in two lines that may possibly interest some of our readers. Applicants are now being received for assistant marketing specialist at salaries ranging from \$1800 to \$2760. Application blanks may be had from the Civil Service Commission at Seattle, Wash. On August 9 examinations for junior micro-analyst will be held at nearly all points where there is a civil service commission. The salary is not stated.

▲▲▲

Kindly mention *Better Fruit* when answering advertisements.

Strawberry Pests

THREE types of serious insects pests attack the roots of strawberry plants. Of these the strawberry root weevil is by far the most destructive. Growers contemplating new plantings should demand that plants be accompanied by an inspector's tag indicating that they were grown in "weevil free" territory. The other root pest are seriously prevalent only on older fields.

It is the exceptional condition at present when more than two full crops of strawberries can be produced on the same land because of these borers. No insecticide nor soil treatment can be used effectively for them. For this reason, if for no other, growers should plan a rotation that includes only two full crop years of strawberries.

Country's Fruit Crop

The total value of fruit and fruit products on farms in 1921 was \$525,000,000, as compared with \$744,000,000 in 1920, and \$755,000,000 in 1919, according to the department of agriculture. The decline is attributed to killing frosts early in 1921 and to lower prices.

Production of apples in 1921 was only 96,881,000 bushels, as compared with 223,677,000 in 1920. Peaches dropped from 45,620,000 bushels in 1920 to 32,733,000 in 1921, and pears from 16,805,000 to 10,705,000. There was a slight increase in production in oranges of 300,000 boxes.

New Growers' Body

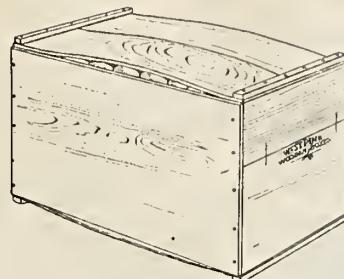
A new growers' co-operative organization, the Wenatchee-Okanogan Co-operative Federation, has come into being at Wenatchee, Washington. It is an inter-district body composed of eight local growers' organizations, all of which formerly belonged to the Skookum Packers' Association. This year's tonnage is estimated at 1700 cars of apples and 300 cars of soft fruits. F. V. Taylor, Wenatchee, is president; F. H. Phipps, Brewster, vice-president; C. W. White, Peshastin, secretary-treasurer; J. A. Warman, Wenatchee, general manager.

Destroying Field Mice

Many berry growers report trouble with mice that follow mole holes to the base of plants or even make tunnels of their own. Both moles and mice can be discouraged by any system of cultivation that will tear out the ridge in the rows between plants. With black raspberries check cultivating will do this, but with trellised plants, a grape hoe is best. Mice can be poisoned easily by mixing 1 ounce of strychnine (alkaloid), one-eighth ounce saccharine and 12 quarts of oatmeal. Scatter it in holes or runways.

▲ ▲ ▲

TELL THE advertiser you read his ad in these columns.



Westpine boxes are made from inspected lumber

EXPERT inspectors pass upon the lumber which is selected for Westpine fruit boxes. They make sure of moisture content; they maintain uniform standard quality.

These tests are a guarantee that Westpine boxes are the best your money can buy. Westpine boxes are the solution of your packing difficulties. Be sure to use them this year.

Write today for "The How and Why of Good Wood Boxes," containing reports of U. S. government tests on apple boxes. A handbook on the proper construction and nailing of wooden boxes.

BOX BUREAU,
WESTERN PINE MANUFACTURERS' ASSOCIATION
510 Yeon Building, PORTLAND, OREGON

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Oregon Lumber Co.	Baker, Ore.
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Shevlin Hixon Co.	Bend, Ore.
Hood River Box Co.	Hood River, Ore.
Union Box Co.	La Grande, Ore.
White Pine Lumber and Box Co.	La Grande, Ore.
Geo. Palmer Lumber Co.	La Grande, Ore.
Grande Ronde Lumber Co.	Perry, Ore.
Nibley Mimnaugh Lumber Co.	Wallowa, Ore.
Deer Park Lumber Co.	Deer Park, Wash.
Wilson and Cahill	Spokane, Wash.
Boise Payette Lumber Co.	Boise, Idaho
Potlatch Lumber Co.	Potlatch, Idaho
Dewey Lumber Co.	Polson, Mont.

WESTPINE WOODEN BOXES



The Nelson "Triumph" ORCHARD LADDER Strength and Lightness

This is the product of 17 years of ladder building. Ask your dealer to show you a "TRIUMPH" or write us for prices and description.

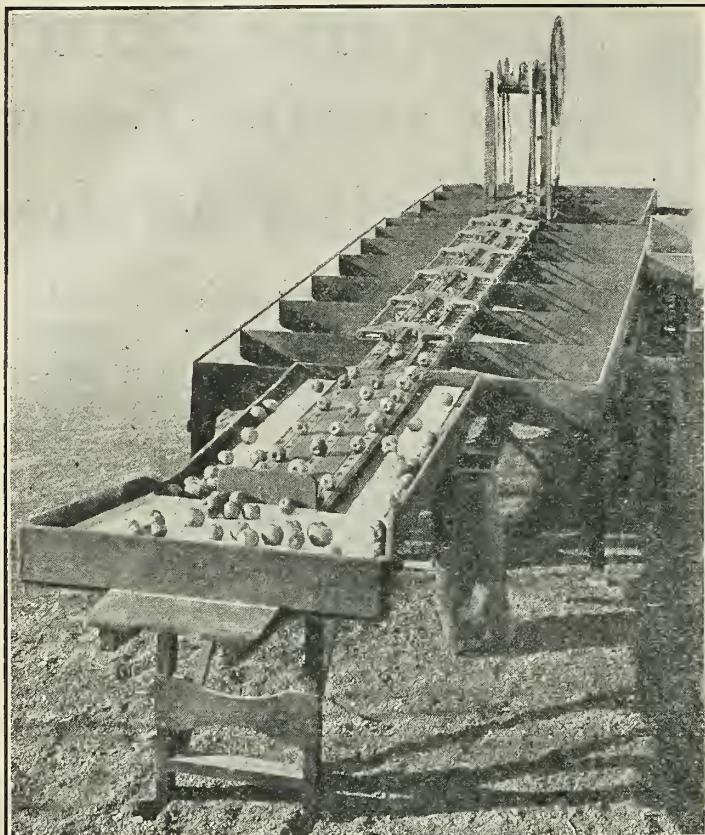
Also all other types of fruit picking ladders

The Nelson Ladder Works

267 SECOND STREET

DEALERS WANTED

PORTLAND, OREGON



This is the IDEAL FRUIT GRADER

THAT WAS ON DEMONSTRATION AT THE FRUIT EXPOSITION LAST NOVEMBER WHICH

was admired by everyone for the following features: Absolutely no bruising of the fruit. The most simple in construction. Nothing to get out of order. Noisless in operation. No springs or weights to adjust. Cost one-half of other makes. Workmanship of the very best. We can supply you in two, three or four grades machines to suit your needs.

We will be pleased to mail you our circulars and prices of the several different size machines we build. Also the name of the nearest agent to your place so you can see for yourself.

Do not wait until too late to get your order in like many did last season.

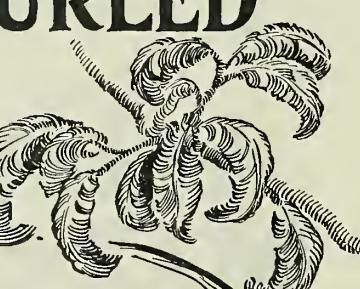
In writing mention the amount you will be packing so we can advise what size machine to use.

IDEAL FRUIT AND NURSERY CO.

GUIGNARD & SONS
Props.

HOOD RIVER,
Oregon, U. S. A.

Are there CURLED LEAVES on Your Apple Trees



Then get busy. That's a sure sign of Aphids. These little insects are sucking the life out of your trees. Kill them unless you want a small crop of dwarfed, speckled fruit. You also run the risk of Aphids killing your trees.

Spray at once with

Black Leaf 40
40% Nicotine

Kills Aphids

Recommended by agricultural colleges and experiment stations. Don't make the very common mistake of thinking that Lime-Sulphur, Arsenate of Lead or Bordeaux kills Aphids. They don't, but if you are using those sprays, simply add Black Leaf 40 properly diluted, and make one spraying do double duty. Aphids also attacks Peach, Plum, Cherry as well as many vegetables and plants. Black Leaf 40 is highly concentrated so that only a small amount is required. The cost is small—only a few cents per tree. Free Spray Chart. Your dealer has Black Leaf 40 and one of our free spray charts. If he is out, write us direct.

Tobacco By-Products & Chemical Corporation

Incorporated

LOUISVILLE, KY.

Profits and Benefits of Thinning

(Continued from page 6)

for the unthinned tree and 14 for the thinned tree.

BY analyzing the data secured in this demonstration, we arrive at the following conclusions:

1. Thinning did not noticeably reduce the yield of saleable fruit.
2. Thinning increased the production of 4 1-2 tier apples 13.2 per cent and of 5 tier eight-tenths of one per cent.
3. Thinning reduced the production of 5 1-2 tier apples 14 per cent, materially increasing the production of 4 1-2 tier.
4. Thinning decreased the production of jumbles 7.1 per cent and of culls 7.1 per cent.
5. The unthinned tree wasted vitality and food material used in the production of 2 1-2 boxes of culls and jumbles. Also the fact that the production of an overload that reduces the size of the fruit tends to reduce production the following year must not be overlooked.
6. Thinning increased the production of extra fancy fruit 17 per cent.
7. Thinning heavily loaded 16-year-old Winesap trees cost approximately fifty cents per tree.

8. The value of the fruit on the thinned tree was worth \$3.20 more than the fruit on the unthinned tree, making the profit due to thinning \$2.70 or 540 per cent based on the cost.

The value was figured at the market price to the grower for the size and grade of the fruit at the time of packing.

RULES FOR THINNING—It is hard to set definite rules for thinning because the amount of fruit to be left on any individual tree varies with the conditions. Young trees do not need as heavy thinning as old. If the ground is very fertile and the trees especially vigorous more fruit may be left than on less fertile soil and less vigorous trees. However, there are a few rules that can be applied under nearly all conditions.

First, never leave more than one apple on a spur.

Second, remove all the apples from the tips of branches if there are other apples located further back on the branch.

Third, remove all apples that are located in positions where they are likely to become limb rubbed or scratched. On colored varieties some attention should be paid to leaving the apples that are located where they will receive the most light and consequently color better. The underneath portion of the tree which receives the least amount of sunshine should be thinned more severely than the outer and upper portions of the tree. This is especially true with Rome Beauty.

Fourth, always remove the smaller specimens and leave only the largest apple of each cluster. The small apples at thinning time will be the small ones when they reach maturity. Remove all imperfect specimens.

Fifth, all limbs should be thinned sufficiently to prevent them from being weighted down far enough to come in contact with limbs below. Of course the lower limbs will be bent down proportionately if they are not stiffer or do not bear less fruit than those above.

Often when this much is done the tree will be thinned sufficiently but usually where there is a full crop additional specimens should be removed. The experienced thinner will know about how much fruit branches of a certain size can bear and bring to good size at maturity and about what is a good load for a given tree, but the inexperienced will need more instructions. The beginner will also be at a loss to know how to deal with the different varieties.

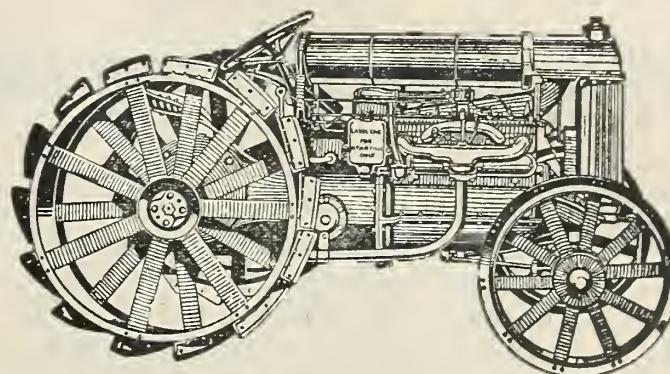
Generally speaking the Winesap needs heavier thinning than other varieties and after the rules already laid down have been carried out additional specimens should be removed. An average distance of ten inches apart, when the fruit is well distributed throughout the tree, is probably about right. If the set of fruit is not so full and not so well distributed throughout the entire tree they may be left a little thicker

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FORDSON FOR EVERY PURPOSE

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Sign and Mail This Coupon NOW

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OF WASH., ORE.,
IDAHO and MONT.

DEPT. B, 700 FAIRVIEW AVENUE, SEATTLE
DEPT. B, EAST 11th and DIVISION STS., PORTLAND

Please send me free information on Fordson Tractors. (Mark X in square opposite literature or service desired.)

—Fordson Tractor Manual.

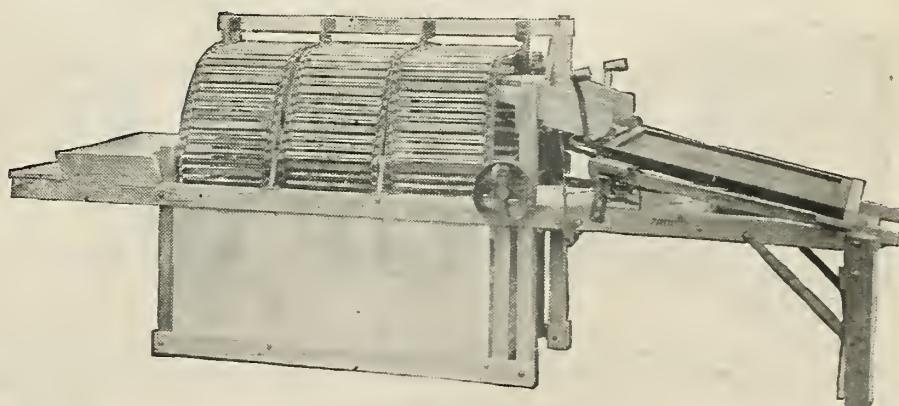
—The Fordson at Work.

—Free demonstration. (State purpose for which Tractor is intended.) If you own a Tractor, state what make.

Name

Address

OUR POWER PRUNE TRAYERS ARE BEST BY TEST

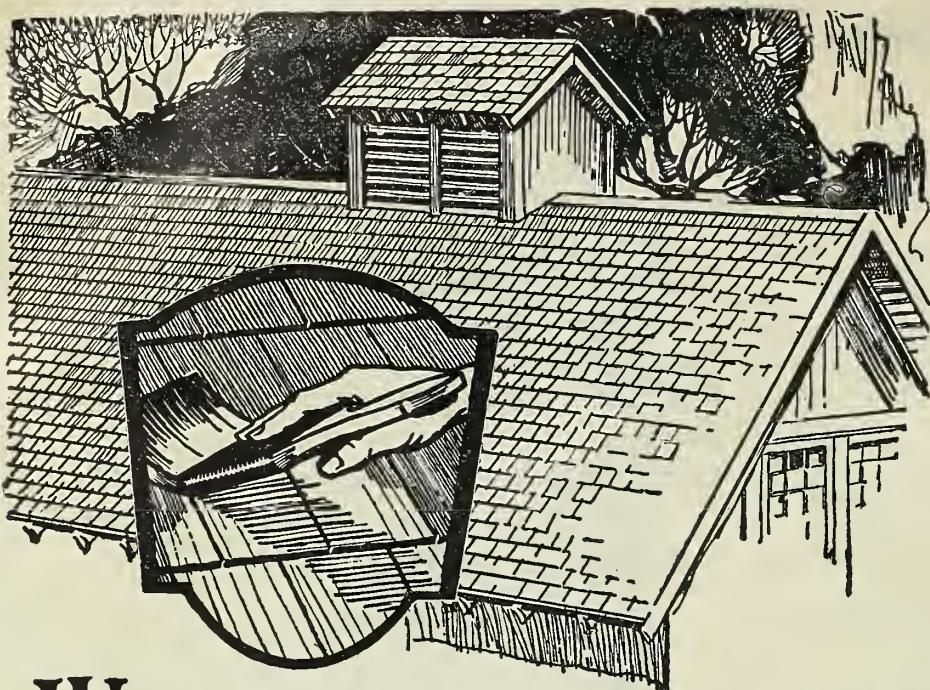


This prune dipper and trayer is our three tank machine for hot and cold water. We also make a single tank machine for one dip in cold water. These power trayers have large capacity quality work, built strong, largest machine only twelve feet long, requires any light power to operate, and will not crush the softest fruit. Buy the old reliable, tested many seasons. Prices right.

SALEM MFG. CO.

SALEM, OREGON

FACTORY LOCATED 1396 N. FRONT and HOOD ST.



Warped shingles on your roof?

Shingles exposed to drenching rains, hot sun and wind, soon lose the strength stored in them by nature. Oils and sap evaporate, the wood becomes brittle. Warping and cracking are sure to follow,—unless shingles are given preservative treatment.

The time to secure continued life and service for shingle roofs is before the natural oils dry out. ORONITE SHINGLE OIL penetrates the wood fibre and holds in their original strength. It keeps your roofs tight and firm—helps prevent warping. In the case of old roofs, ORONITE SHINGLE OIL renews their life.

You can mix ORONITE SHINGLE OIL with colors. We have an agent near you who will give you formulas—also show you how easily ORONITE SHINGLE OIL is applied, both to roofs and shingled side walls.

STANDARD OIL COMPANY
(California)



ORONITE SHINGLE OIL

Musical
Merchandise

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Write
Us

WE SAVE YOU MONEY!

W. Martius Music House, Inc.

1009 First Avenue, Seattle, Washington
Everything Known in Music

SHEET
MUSIC

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Write
Us

Jonathan also need heavy thinning but may be left a little closer together than Winesap because the fruits are not usually so well distributed.

Rome Beauty is an especially hard variety to thin because of the nature of the fruiting branches and the tendency of the fruit to hang in clusters even after being thinned to one on a spur. On the younger trees it is usually sufficient to remove only as many more specimens as necessary to keep the apples from coming in contact with each other when they reach maturity. Older trees require considerable thinning. The fruit hangs out of sight in an inconspicuous manner and one must do considerable thinning from underneath the branches or too many apples will be left on.

There is still another type of variety like Winter Banana, Spitzenburg, and Wagner that bear their apples on short spurs along rather heavy straight branches. Such varieties may be left about six inches apart along the fruiting limbs.

To give further detailed rules regarding additional varieties might serve rather to confuse the beginner than to be of further assistance.

With a few varieties which grow in clusters and with very short stems it may be necessary to use thinning shears especially if they are allowed to grow too large before thinning is done. With most varieties and under most conditions, using only the hands is to be preferred. One can do much faster work than in any other way. With a little practice the thinner can learn to snap the apples off their stems with the thumb and fingers very rapidly and without injury to the spurs or remaining fruits.

SUMMARY—In conclusion we can sum up the value of thinning in ten statements:

1. Thinning helps to maintain the vigor of the tree and thus tends towards the annual production of normal crops.
2. Thinning increases materially the size of the fruits.
3. Thinning increases the percentage of Extra Fancy grade.
4. Thinning decreases greatly the percentage of culls and jumbles.
5. Thinning helps to control pests and disease.
6. Thinning decreases the number of windfalls and drops.
7. Thinning prevents the breaking of many branches and makes propping unnecessary.
8. Thinning saves labor in picking, grading and packing which more than compensates for the labor of thinning.
9. Thinning increases the value of the crop and the orchard.
10. Thinning pays dividends which should range from five hundred to a thousand per cent of the cost.

When the value of thinning can be summed up in ten such important considerations as these, what orchardist cannot afford carefully to thin his fruit?

WASHINGTON

RECENT reports on apples and pears in the Kennewick district estimate this year's crop at 50 per cent of normal. Light blooming and frosts cut the yields. The same report is made for the Sunnyside district. The estimate on apples for the Grandview territory is 60 per cent of a normal crop.

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BELLINGHAM reports that the district will experience the most extensive canning operations of its history. In northwestern Washington ten plants will can fruits and most of them vegetables as well. The San Juan Canning Company plant has been taken over by J. M. Henry and associates of Spokane and will be enlarged in capacity and operations.

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ANNOUNCEMENT has been made by Frank Harkness, general manager of the Earl Fruit Company of the Northwest, of plans to establish packing houses in various points and engage in the shipment of lettuce and rhubarb from western Washington. A selling agency for the company will be established in Seattle.

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RUST appeared this spring in the spinach grown in the Walla Walla Valley and caused heavy loss. This was a new trouble and Professor F. D. Heald of Washington State College was called by District Horticulturist J. W. Wiley to help seek a means of controlling the rust.

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INSTALLATION of permanent pipes through orchards for use in spraying operations is reported to be winning favor in the Wenatchee district. It is said that at least a dozen such installations were made this spring, following successful trials by a few orchardists in other years. The idea was first tried out 12 years ago by A. J. Dear but he had to abandon it when a new irrigation system was arranged.

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F. STANLEY MILLICHAMP recently began setting out 40 acres of D'Anjou pears. When the planting is completed he will have the largest exclusive D'Anjou orchard in the state, it is said. The trees are being set 25 feet apart in triangular layout, with fillers of Moorpack and Tilton apricots and Tuscan cling and Elberta peaches.

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C. A. PERKINS, head of the Independent Fruit & Storage Company of Opportunity, has announced plans for construction of a \$10,000 apple packing plant at Greenacres. The plant will have a capacity of 100 cars a season.

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R. H. DUDDY, general chairman of the Yakima committees on entertainment of delegates to the Seattle shippers' convention, and J. Walter Herbert, publicity chairman, departed the first of June for eastern cities to boost for the convention and urge the delegates to visit Yakima.

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THE BERRY crop handled and controlled by the Puget Sound Berry Growers' Association will exceed that of last year by at least 25 per cent, according to statement of R. D. Bodle, sales manager of the organization. Shipments in commercial quantities were under way the second week in June. Winslow Island sent out the first berries.

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PLANS are under way in the Walla Walla district to test out the profitability of cantaloupe growing. Two growers of the Burbank-Two Rivers-Attalia section have planted acreages of Heart of Gold cantaloupes and have trial orders from Spokane. They expect to get on the market about the middle of this month and to continue shipments until the middle of September.

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WENATCHEE reports the biggest cherry crop of recent years, estimates placing the tonnage at 140 cars. Peaches are said to promise a

BETTER FRUIT

crop of about 200 cars as compared with 225 last season. The apricot crop is estimated at 100 cars.

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THE Washington Berry Growers' Association, F. H. Krug sales manager, has entered the Puget Sound head lettuce deal this year and expects to ship from its territory, principally the Sumner-Puyallup district, 200 cars. Shipments began the latter part of June and will continue until the end of October.

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AT A MEETING of the Yakima Shippers, Inc., J. Walter Herbert was elected chairman of the board of directors; B. A. Perham was made vice-chairman and L. J. Bunting secretary-treasurer. The officers are perfecting details of getting the organization under way.

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THE tent caterpillar is doing extensive damage in western Washington fruit sections, according to Department of Agriculture officials. They report that on Vashon Island, where the season is early, the pests have cleaned the foliage from the smaller trees and are attacking gooseberry and currant bushes.

OREGON

THE Umpqua Valley prune market opened June 17, with heavy buying. Sales were reported to have amounted to almost 3,000,000 pounds on the opening day. Top grades brought 9½ cents, with quarter cent reductions down to 40-50s where there was a drop of one-half cent. The crop of Douglas County is expected to be a record one this year.

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H. A. WOODS of The Dalles is erecting a new prune dryer which operates by what is known as the vacuum method. Last year he sent a quantity of prunes from his big orchard to be dried in the east by this method. He was highly delighted with results, as he found the prunes dried more evenly and retained more of their juice than under hot air drying.

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THE Falls City cannery has been purchased by a group of men headed by G. A. Griswold, lumberman. C. J. Pugh and Miss L. M. Marshall held a majority of the stock in the company which owned the plant. Mr. Pugh decided to sell when made superintendent of the new Oregon Growers' cannery at Salem.

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F. B. GUTHRIE, with the field department of the Oregon Growers' Co-operative Association in Douglas County the past two years, has been transferred to the Willamette Valley, taking the place of Earl Pearcy. Mr. Pearcy has been placed in the fresh fruits sales department. Fred Strang succeeds Mr. Guthrie in Douglas county.

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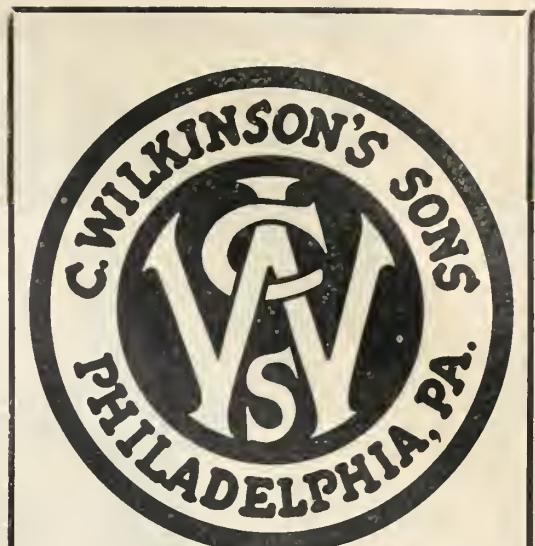
THE Apple Growers' Association has purchased the big cold storage plant of the Davidson Fruit Company and now owns all the cold storage space in Hood River. The price paid for the property is said to have been \$50,000. The building is of brick and has ground dimensions of 40 by 250 feet. To finance the deal the association has issued seven per cent bonds.

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AN EXCELLENT booking of orders and a busy year is at hand for the Umpqua Valley Canning Company, recently organized by Roseburg business men and farmers. It took over the plant of the A. Rupert Company. A short time ago orders valued at \$25,000 for six carloads of products were booked in one day. The plant will be run at full capacity.

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CLAYTON L. LONG, extension horticulturist of Oregon Agricultural College, visited Hood River the first of last month and held a meeting and demonstration on the value of thinning apples. A few days later Professor Long conducted



**SERVICE
FIRST**

**WE DON'T
KNOW IT
ALL—**

**We don't know the poultry
trade**

**We don't know the butter
trade.**

**We don't know the egg
trade...**

BUT we DO know the Fresh Fruit and
Vegetable trade.

WE are SPECIALISTS. We've got plenty to do covering this one trade without attempting to cover them all. We believe in concentrating our efforts in one industry instead of scattering them everywhere.

We have been located in this one spot for over sixty years. In that time, we have gained a thorough knowledge of the industry.

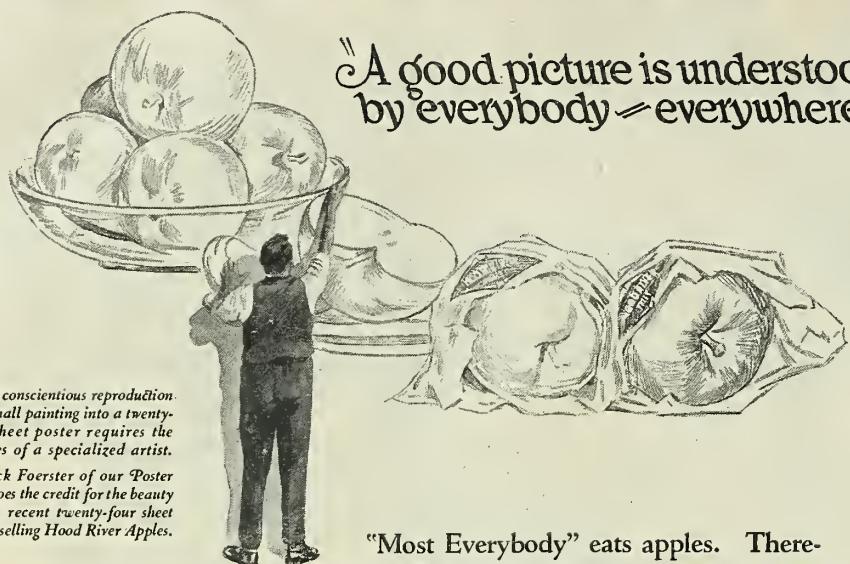
Get in touch with the house whose whole organization includes only up-to-date experts in each and every department; whose business is based strictly on a uniform commission basis—that of handling consignments exclusively. Look us up. Let us get acquainted.

C. Wilkinson's Sons
(Ralph B. Clayberger)

Carlot Receivers and Distributors Fresh
Fruits and Vegetables Exclusively on
Consignment

**134 DOCK STREET
PHILADELPHIA, PA.**

Philadelphia's Oldest Commission House.
Located in this one spot for over sixty years
(Founded 1861)



THE conscientious reproduction of a small painting into a twenty-four sheet poster requires the services of a specialized artist.

To Jack Foerster of our Poster Staff goes the credit for the beauty of this recent twenty-four sheet that is selling Hood River Apples.

"Most Everybody" eats apples. Therefore it's quite necessary to talk to "most everybody" when you're advertising apples.

But, six people out of every ten in the United States can't read and write the English language—almost two-thirds of the people who buy apples. Unless you talk to them you're not talking to "most everybody."

That's why we maintain a busy staff of expert poster artists! A good picture tells the story vividly and is understood by "most everybody."

SCHMIDT LITHOGRAPH COMPANY
Advertising Service



Why Not Order Now?

TREES
For Resetting or New
Orchards

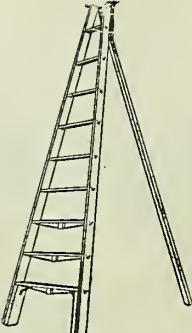
Our supply will take care of your needs and you will receive stock which is well grown and reliable.

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WE NEED SALESMEN

**Northwest
Orchard
Ladders**


"The Quality Line"
 For Sale by
 Leading Dealers Everywhere
 Manufactured By
**Northwest Fence and
Wire Works**
 PORTLAND, OREGON

like demonstrations on both pears and apples at Medford.

▲▲▲
THE NEW cannery at Stayton, which had been under construction since early spring, began operations on strawberries June 10. The following are officers of the company: George Knech, president; George H. Bell, secretary-treasurer; John Dozler, Henry Fangman, George A. Smith, Joseph Waltz, R. D. Hoke and Joseph Sestak, directors.

▲▲▲
DIRECTORS of the Eugene Fruit Growers' Association last month decided to enlarge their prune evaporator, already one of the largest in the state. The plant will have a capacity of 85 tons of green prunes when the addition is finished. The decision followed report of Manager J. O. Holt that the crop this year will be the largest the association has ever handled.

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THE FIRST cars of Wasco county cherries sent east were dispatched June 21 and 22 by the Oregon Growers. Private shippers sent forward a car the next day. Bings and Royal Ann's composed most of the shipments.

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WALTER NEWELL has purchased from W. J. Filz a ranch of 163 acres in the Mt. Hood section of the Hood River Valley and will devote large acreages to cherries and peaches. Thirteen acres of bearing orchard has been purchased from H. P. Allen by Harvey Jones. Mr. Jones is a West Side orchardist who already owns 20 acres of orchard adjoining that just purchased for \$13,300.

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THE packing plant of the Oregon Growers' Cooperative Association at Salem is being remodeled and machinery is being installed so it may be operated. Heretofore the association has handled its canning in other establishments, principally at The Dalles.

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THE DALLES plant of King's Food Products Company opened up a few days ago on apricots. F. L. Phillips is in charge during the absence of Manager C. C. Ross. Dehydration of spinach was completed the middle of June.

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LATE FROSTS and a shortage of irrigation in the Dee Flat section combined to cut the Hood River Valley strawberry crop under original estimates. Latest figures indicate that production will run about 85,000 crates, which was the figure also for last year. Picking began in most districts about the first week in June.

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CONTRACTS for an increased acreage of broccoli and brussels sprouts have been negotiated by the Holt-Chase Cannery Company of Portland with the ranchers of the Myrtle Point district. Growers expect to realize about \$150 an acre from their broccoli. The sweet corn acreage of the district will be about the same as last season.

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Y. SHIMA, horticulturist of the Imperial Agricultural Experiment station at Aomori, Japan, spent the first two weeks of June in the Hood River section studying methods of apple culture. He said that apple growing is becoming popular in Japan, with demand constantly on the increase.

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IT HAS BEEN announced in the east that the firm of Sgobel & Day has been appointed distributor for the Dufur Orchard Company, which expects to produce 150,000 boxes this season. C. W. McCullagh is northwestern manager for the firm, with headquarters in Portland.

It serves several good purposes if you mention BETTER FRUIT when answering advertisements of this issue.

CALIFORNIA

INDICATIONS in the Sacramento River Valley are said to be that the pear crop will be 75 per cent as large as in 1920. The district produces about two-thirds of the state's pears. The cherry crop was found to be about 70 per cent of normal.

DR. S. W. R. LANGTON of Stockton recently purchased the Fleischhacker interests in the Arboga district and plans to spend about \$500,000 in developing 1000 acres. He says he will begin by planting 100 acres to peaches and 100 acres to shipping plums and cherries.

THE United Fruit Company of Newcastle is said to have paid \$10,000 for a ranch of 660 acres near Auburn, purchased from Ivan H. Parker.

PLACER COUNTY holds first rank in the state on plum production, with 434,279 bearing and 64,357 non-bearing trees, according to data collected last year.

A LARGE dehydrating plant will soon be opened at Woodbridge by the Kings Food Products Company. It will employ between 100 and 150 persons and will handle apricots, prunes, peaches, green beans and spinach.

J. M. SILVA of Watsonville has a half-acre of raspberries from which he expects to clear \$400. The tract is a sheltered one and Silva was the first to place raspberries on the San Francisco market. His first shipment averaged him 50 cents a basket.

C. H. PETERS of Banning, is experimenting with peach grafted on apricot roots. He has about 15 of these trees growing well in light, sandy soil.

REORGANIZATION of the California Almond Growers' Exchange was effected at a meeting in San Francisco June 1. It was disclosed that 2500 commercial growers had signed the five-year agreement which was framed to replace the old yearly agreement system. The old officers and board of directors were retained, T. C. Tucker being continued as manager.

ALL ESTIMATES are that this state will break its record for deciduous fruit shipments during 1922. The estimates run from 50,000 to 55,000 cars. Last season's shipments aggregated 40,240 cars and those of 1920, 35,420 cars.

THE final carload of apples was shipped from Watsonville the second week in June, nearly a month earlier than the wind-up of the 1920-21 season. Shipments from the district aggregated 2985 carloads, 109 more than for the previous year. The estimate for this season runs as high as 4000 cars.

THE Rio Oso Fruit Company is planning to plant one of the largest peach orchards in the Sacramento Valley. There is 400 acres of land in the tract to be planted. It lies south of Yuba City.

A. D. POGETTO, for several years manager of the Earl Fruit Company at Loomis, has been selected general manager of the California Canning Peach Growers' Association. General offices of this new organization are located in San Francisco, with branches at Fresno and Yuba City.

THE cherry crop being handled by the San Joaquin County Cherry Growers' Association, at Farmington, will be only about half what it was last year, the estimate placing shipments at 30 cars.

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The Viking converts 60 per cent of the power supplied into useful work. Some pumps utilize only 30 to 40 per cent, but the Viking maintains its high operating efficiency of 60 to 65 per cent under all average pumping conditions.

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Viking Catalog full of good pump information mailed upon request.

De Laval Pacific Company

San Francisco

A Valuable Book

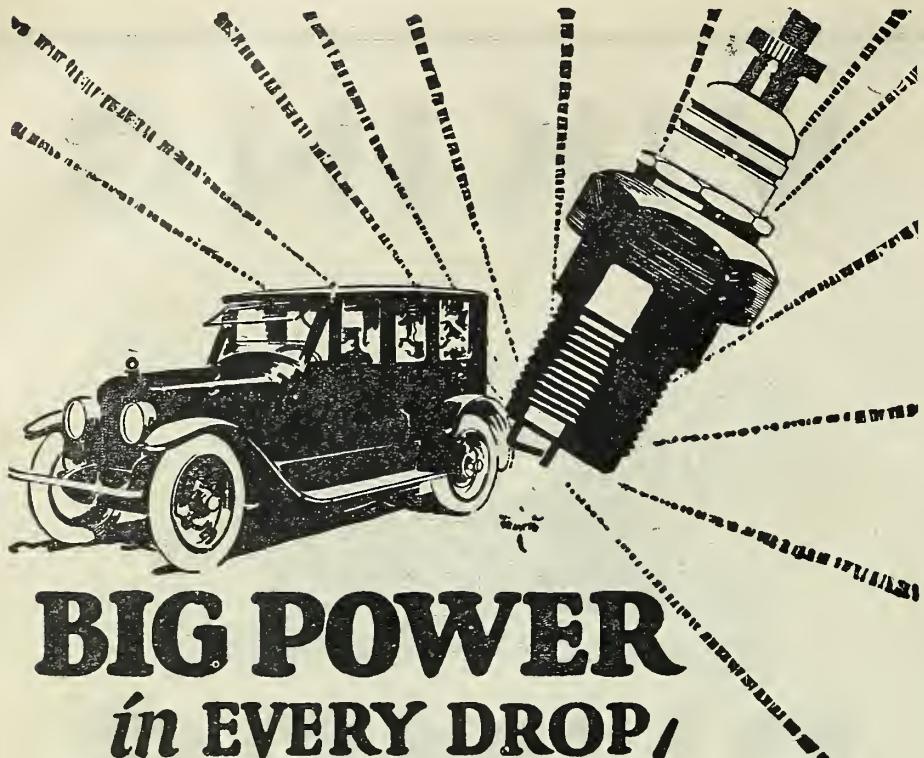
"The Commercial Apple Industry of North America"

Published by the Macmillan Company is a new book covering all phases of the Apple Growing Industry that "Better Fruit" highly recommends to apple growers or those who contemplate engaging in this occupation. Its authors are J. C. Folger, Assistant Secretary International Apple Shippers' Association, and S. M. Thompson, formerly Fruit Crop Specialist, U. S. Department of Agriculture. It is edited by L. H. Bailey, the well known authority on horticulture.

If you are interested in obtaining a copy of this valuable book send us \$3.50 and we will have same forwarded to you. Remit by postoffice money order or check to

Better Fruit Publishing Company

Twelfth and Jefferson Streets, Portland, Oregon



BIG POWER in EVERY DROP!

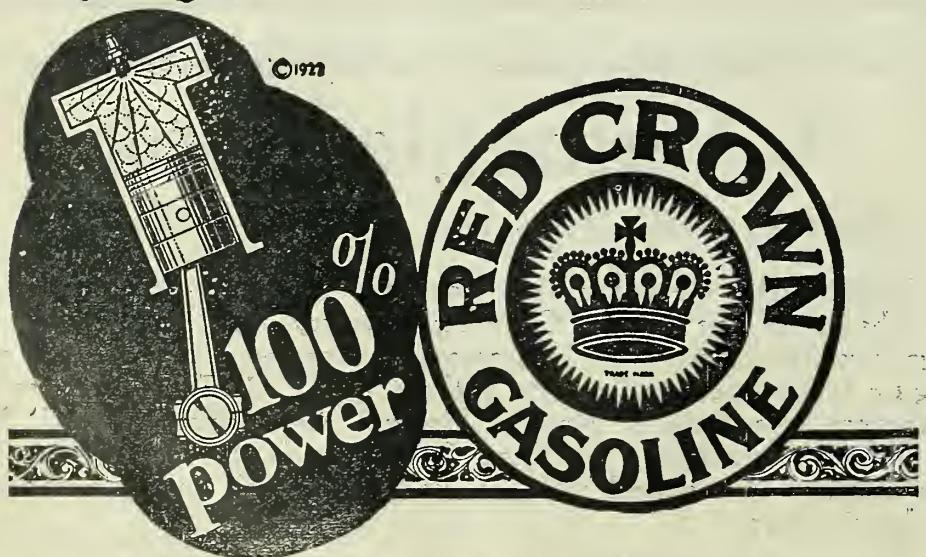
"Red Crown" meets the automotive engineer's demand for a motor fuel that will vaporize *rapidly* and *uniformly* in the carburetor, and explode *completely* in the cylinder. Every drop is 100% power.

Fill your tank with "Red Crown" and *nothing else*, and you won't have to bother with carburetor adjustments. You'll get prompt starting, better mileage, and a sweeter-running motor.

Fill at the Red Crown sign—at Service Stations, at garages, or other dealers.

STANDARD OIL COMPANY
(California)

*The Gasoline
of Quality*



NICE BRIGHT WESTERN PINE FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH.
Catalog mailed on request.

FREE An 8x10 Enlargement
With \$3.00 Worth of
Kodak Finishing. Quick Service
Films received forenoon mailed out same
day. We pay return postage.
All Work Guaranteed
WOODARD, CLARKE & CO.
Alder at West Park PORTLAND, ORE.

THE Clyde Grimes apple orchard at Watsonville in the Corralitos district, 29 acres in extent, has been sold to Jacob Spain for approximately \$19,000. The trees are in full bearing.

IN THE Department of Agriculture appropriation bill recently enacted and signed by President Harding, was allotted \$9,000 for deciduous fruit bud selection work in this state.

IDAHO

EMMETT, which is one of the leading peach shipping towns of the state, will have about 80 per cent of a normal crop to send out this year, it is estimated. Last year the crop was very small because of frosts. Shipments will start during early August.

THE peach crop of the state is officially estimated at 208,200 bushels this year, as compared with 150,000 bushels last season. A large portion of the crop will be shipped in bushel baskets.

A FULL crop of Italian prunes will be harvested this year in and around the Boise Valley, according to Harry L. Yost, sales manager of the new Idaho Fruit and Vegetable Exchange. It is said that at least 2000 cars for shipment as green prunes will be produced.

H. B. TABB has been obtained as general manager of the Idaho Falls Potato Growers, Inc. This body was organized during the spring. Its officers are: Charles J. Carlson, president; Eli T. Simmons, first vice-president; A. E. Stanger, second vice-president; Jesse H. Nielson, secretary-treasurer. At last reports the organization had 4250 acres signed up.

ONLY a small portion of the head lettuce crop in the Boise Valley was planted for June shipment. The bulk of the crop, which is to be much larger than that of last season, was planted for October maturity.

BECAUSE of differences that had arisen the government and state departments of agriculture will not co-operate this year in inspection of fruits and vegetables. Criticism of the federal law governing shipping point inspection by Miles Cannon, state commissioner of agriculture, is understood to have helped bring a breach between state and federal agencies.

Marketing News of Interest

ACCORDING to estimates given out by J. B. Crawford, assistant general manager of the Pacific Fruit Express Company, the Union Pacific railroad counts on shipping from five northwestern states it serves, some 158,000 carloads of fruit this season. He said this road handled 110,000 carloads last season and the O-W. R. & N. 20,000 cars. His own company has under construction 3300 new cars, deliveries of which have now begun at the rate of 20 cars a day.

I. E. GRINER, general orchard superintendent of properties of the American Fruit Growers in the Yakima Valley, forecasts an increase of 25 per cent in production over last year. Last year these orchards yielded 86,000 boxes and this year he believes they will produce 110,000 boxes. Anjou and Winter Nelis pear crops are better also but the Bartletts will be short of last season's yield.

PRICES in the Winesap pool of the Yakima Valley division of the American Fruit Growers, 210,000 boxes, have been announced by F. E. Miller, manager. He gives the f. o. b.

Follow the Violet Lines. There is Merit in the Wrapper.

**"CARO"
fruit
WRAPPERS**

This
is the
POINT

**"CARO"
PROTECTS**

"Caro" Protects—"Caro" Prolongs the Life of Fruit—Why?

CHEMICALLY TREATED WITH BORDEAUX MIXTURE

FRUIT MATURITY is retarded by cold or refrigeration and hastened by heat or atmospheric exposure.

The soft fibrous silk-like texture of "Caro" provides just sufficient ventilation to retard the ripening process.

FRUIT DECOMPOSITION starts from a bruise which opens tiny holes and permits juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, destroy BACTERIA and FUNGUS SPORES and arrest decomposition.

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E. 6th & ALDER STREETS,
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EAT MORE PRUNES

PRUNES ARE SANITARY

Contrary to common opinion, there is no more sanitary food article on the market than the processed and packed prune. After going through boiling water and live steam they are not handled again, but dropped immediately into wax paper lined boxes, when they are packed ready for market.

PRUNES ARE HEALTHFUL

All fruits are generally considered a great aid to health because of their acid contents and laxative qualities, and to this prunes are no exception. Much work has been done lately on the absolute need of certain factors towards health in our food, an important one of which is vitaminine.

From a summary published in The Journal of Biological Chemistry, Vol. XLII, No. 3, Page 471, in which the comparative value of certain fruit from the standpoint of the water soluble vitamine contained in each is discussed, we learn that prunes are among the fruits listed as containing this valuable food content.

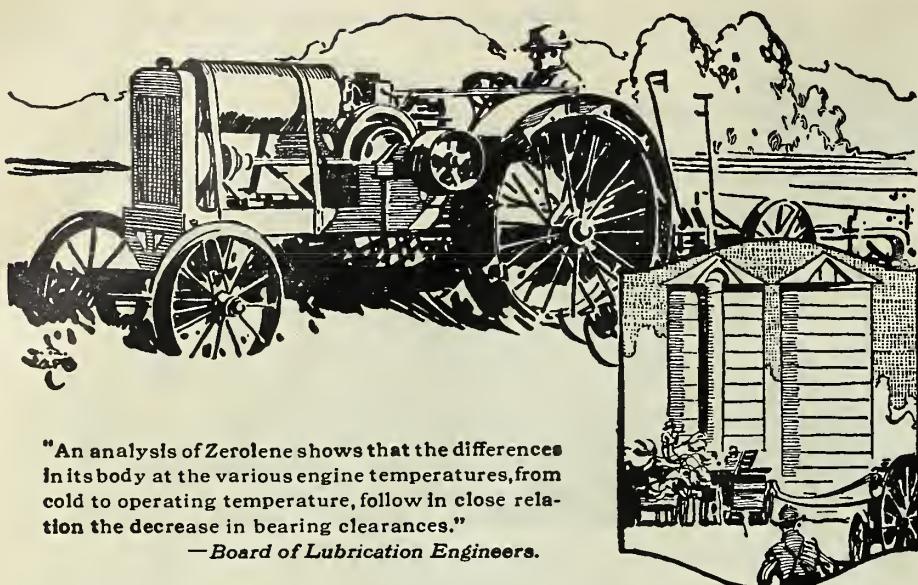
PRUNES MAY BE PREPARED IN MANY WAYS

In pies, cakes, candies, puddings, in fact in any way you would use dried fruit, prunes excel. You will like their rich, tart-sweet flavor.

MISTLAND AND BESTWEST BRANDS

Represent the finest of dried prune perfection. If you ask for these brands you will not be disappointed. Insist upon them.

WASHINGTON GROWERS' PACKING CORPORATION VANCOUVER, WASHINGTON



"An analysis of Zerolene shows that the differences in its body at the various engine temperatures, from cold to operating temperature, follow in close relation the decrease in bearing clearances."

—Board of Lubrication Engineers.

FLEXIBILITY! Zerolene maintains always the right lubricating body—

When your tractor engine "warms up" to a stiff job of plowing or belt driving, be sure there's an oil in the crankcase whose "body" will adjust itself properly to those decreasing bearing clearances caused by heat expansion.

Zerolene, being flexible, helps to keep bearings cool, and maintains always a perfect piston seal—gets more work done, with greater ease and speed.

Among other advantages Zerolene has these three:

Stability—the ability to resist engine heat.

Oiliness—the ability to cling evenly to bearing surfaces, at the same time offering in itself a minimum of internal, frictional resistance to the engine power going to the traction wheels.

Purity—Zerolene oils are pure. The Standard Oil Company has always considered the removal of all detrimental properties and compounds as essential in making Zerolene.

Consult the Zerolene Correct Lubrication Chart for the correct grade for your tractor, truck or automobile.

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more power & speed ~
less friction and wear ~
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SAN FRANCISCO.

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prices with only the selling charge to be deducted, as follows: 3½-4 tier, \$2.20, \$1.95 and \$1.50; 4½ tier, \$2, \$1.80 and \$1.40; 5 tier, \$150, \$1.20 and \$1.10.

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THE WENATCHEE District Co-operative Association has closed its last apple pool for the 1921 crop and officially finished its first year's operations. During its first year, the association paid out to growers over \$3,000,000, representing the proceeds of selling slightly less than 2,500 carloads of apples and soft fruit. A loan amounting to about \$750,000 was negotiated in the spring to finance the members during the season. This was paid back on time, and substantial payments were made on the string of warehouses purchased by the association from the Wenatchee Northern Warehouse and Marketing Company.

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OPENING prune prices were announced by the Oregon Co-operative Growers' Association at Salem on June 16 as follows: 30-40s, 11c; 40-50s, 9½c; 50-60s, 8½c; 60-70s, 7¾c; 70-80s, 7c; 80-90s, 6½c; 90-100s, 6c.

The opening prices for Petites were: 40-50s, 11½c; 50-60s, 10c; 60-70s, 9c; 70-80s, 8c; 80-90s, 7½c; 90-100s, 7c.

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FROM The Dalles it was announced on June 20 by manager C. R. Thompson of the Oregon Growers that two-thirds of the Royal Ann cherry crop marketed through the association had been taken by the Libby, McNeill & Libby cannery at 8 1-5 cents a pound. Last year's price was 4 cents. For The Dalles district it was said the Royal Ann crop would be better than last year.

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FRUIT crop prospects for Oregon are reported as near normal except that cherries are a short crop. Peaches also are probably slightly below normal and this may prove true of loganberries. Prune yields in most districts are to be good and apricots will give a normal yield.

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BUYERS around Wenatchee opened the cherry season with offers of 10 cents for Bings and Lamberts. The growers were a bit slow in accepting the price. Other varieties opened around 7 cents. Apricot prices were established at \$70 to \$80 a ton in bulk and \$1 to \$1.25 a crate of 20 pounds.

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ON JUNE 20 it was announced that the California Packing Corporation had contracted for the prune crop from the J. J. and Clara Niccole orchard near Medford, estimated at 185 tons. The contract amount is said to run over \$35,000, with the price a quarter cent above that received by the growers last year.

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MEMBERS of the California Cherry Growers' Association were reported to have contracted their entire crop to packing houses at \$9.20 per hundred pounds. All the old pack of cherries is sold and there are no left-overs.

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FINAL returns on a total of 300,000 boxes of Oregon and Washington apples handled by Dan Wulie & Co., of London, were said to show an average of \$1.452 per box. On the apples shipped to England, about four per cent of the total, the returns averaged \$1.55.

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THE ROGUE RIVER section of the Oregon Growers followed the lead of the California Pear Growers' Association and set the price of Bartletts for canning purposes at \$75 a ton for No. 1 grade and \$40 a ton for No. 2 grade. Both prices are f. o. b. shipping point. At these prices the pears will all be hand sorted and graded by the association.

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PLUM output for the state of California last year was 93,030 tons, of which, close to 78,000 tons was exported, with an average return to the grower of four cents.

ACCORDING to officers of the California Peach Growers' Association, the state-wide crop this year will be 92 per cent of normal.

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THE FIRST good cherries to reach the New York market arrived in that city May 12, from Vacaville, Cal., in a pony refrigerator. They were sold at auction. A box of 11-row Advance sold at \$16.45; three boxes of 12-row at \$9; one box of 13-row Burbank at \$7.25 and three boxes of 12-row Chapman at \$12.

Washington Growers' Corporation Notes

LACK of rain, together with dry winds and hot weather has brought the strawberry season here to an untimely close. The association has handled upwards of 12,000 crates, however, which is about 4,000 less than was handled last year. The berries, due to lack of moisture, were lacking in quality and size, and, some say, in flavor. There has not been the demand for fresh strawberries that has characterized other seasons, and the prices received have not netted the grower what he anticipated. One redeeming feature of the situation has been the quantities of berries used by the canneries.

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THE USUAL variety of estimates as to the size of the coming prune crop are coming in. These vary from a light crop to one above normal. In some districts orchards are too heavily loaded while in others the crop is considered light and spotted. It is conservatively estimated that the association should market in the neighborhood of 8,000,000 pounds. There is the July drop to be considered, however, and unless considerable rain falls within the next week or so, the drop will probably be heavy.

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MANY growers are now planting late, or main crop, potatoes. More than usual interest is being taken in certified potatoes, and the acreage will be greater than ever in Clarke county.

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NOTWITHSTANDING the unfavorable winter for growing broccoli, which resulted in practically destroying the 1921 crop in this district, many acres are being set out this year. This is a fine crop for overflow lands along the river, as the water usually recedes just when the broccoli should be set out. It is a crop that matures in the spring and is ready for market just when the farmer needs funds for taxes and to finance his spring work. It comes on at a time, too, when the public is hungry for fresh vegetables and brings fair returns to the grower.

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W. H. WOOD of Washougal has assumed the position of general manager, succeeding M. J. Newhouse, who resigned to accept the position of assistant general manager, of the Oregon Growers' Co-operative Association. Mr. Wood owns a large prune orchard at Washougal and has been a member of the board of directors of the association since it was organized in 1919. His education and training has peculiarly fitted him for the position of responsibility which he now fills.

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THE PRUNE packing plant of the association will be enlarged to make it possible to handle a large crop of prunes in the shortest possible time. New machinery will be installed, a new modern processor and grader having been ordered. From the time the first prunes are delivered, two or more cars will be shipped out daily. A day and night crew will probably be employed, and it is hoped that the growers will not have to hold their prunes on the farm more than a few days after they are ready for delivery.

1 chocolate strength



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Pack ground chocolate in bulk [which we don't] and it loses strength every minute. Pack it in cans [which we do] and every bit of chocolate strength is saved and stored for the moment of use. The uniform chocolate strength characteristic of Ghirardelli's is a matter of blending. Keeping this chocolate strength uniform is a matter of packing. That's why Ghirardelli's is never sold in bulk but in cans only. Send for recipe booklet.

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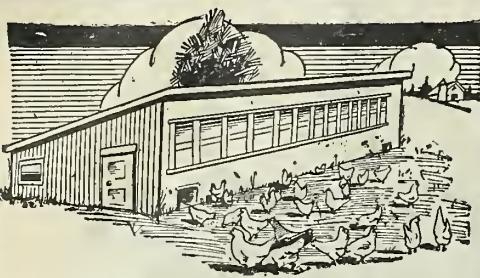
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Knowing what the other fellow is up against and how he is solving his problems is a big help in meeting our own.

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SASH AND DOORS O. B. Williams Co.

1943 First Avenue South, Seattle, Wash.
Largest mill in the West selling direct to the user. Saves you all middleman's profits.

Chicken House Sash
20 in. wide by 25 in. high, 80c.
A dozen different sizes in stock for prompt shipment.

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36 in. by 40 in. Price glazed \$2.00.
This is the size recommended by Western Washington Experiment Station. Orders filled promptly.

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Five cross panel doors, 2 ft. 6 in. by 6 ft.
6 in., at each.....\$3.13
One panel doors, at each.....\$3.67
Money cheerfully refunded if not satisfied. Write for free illustrated catalog No. 19. Contains helpful hints for remodeling the old home or planning the new one.

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Protects poultry against vermin—Preserves wood against decay. When you buy Carbolineum be sure you get Carbolineum and not something called just as good. Write for prices and circulars.

CARBOLINEUM WOOD PRESERVING
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With the Poultry

CULLING THE FLOCK

IT IS generally recommended to cull gradually in June and rather heavily in July and August, although the general management will influence the time of culling. The production of the flock influences the time of culling. To obtain breeders a later culling will be worth while as all hens still in production in September, October and November would be the better producers in a flock and hence the better breeders.

The following chart gives a combination of characteristics, both of culled and good producers, that indicate fairly accurately the type of hen, even though a few good ones might be eliminated.

Characteristics of culled. 1. Early molters. 2. Yellow vent. 3. Yellow shanks. 4. Yellow beaks. 5. Yellow earlobes. 6. Yellow skins. 7. Non-flexible pelvic bone. 8. Shriveled-up comb. 9. Small body capacity. 10. Poor condition.

Characteristics of good hens. 1. Late molters. 2. Pale vent. 3. Pale shanks. 4. Pale beaks. 5. Pale earlobes. 6. Pale skin. 7. Flexible pelvic bones. 8. Comb, red, full and waxy. 9. Good body capacity. 10. Good condition.

Successful culling depends upon using a combination of tests at the right time of year rather than using one test alone.

Marking the best fowls with colored leg bands is of considerable value. During the culling season all those that were banded as early maturing pullets the previous fall and are still in production during the culling are excellent individuals to keep and for breeders a later selection would be beneficial even in October and November.

Poultry culling will produce dividends.

DEVELOPING THE PULLETS

ALTHOUGH a pullet will grow and increase in weight a little after she has begun laying, the date on which she laid her first egg is considered as the time she matured.

Where pullets are raised and kept primarily for egg production the flock owner will wish to hasten the time of maturity as much as possible.

It is advisable to keep buttermilk or skimmilk before the pullets during the growing period and even longer if possible.

Until the pullets are eight weeks old they receive equal parts by weight of oatmeal cracked wheat and finely cracked corn for scratch. The wheat can, however, be fed to the chicks whole after they are three or four weeks old. Beginning at eight weeks the oatmeal can be gradually dropped from the ration. A little later the wheat can be dropped also. As you cut down on the oatmeal and wheat you can substitute a good grade of oats. After the chicks are three months old they will be receiving two parts, by weight, of coarsely cracked corn and one of oats.

Up to the eighth or ninth week the pullets can be fed a dry mash made up of 3 lbs. wheat bran, 2 lbs. corn meal, 1 lb. dried buttermilk, $\frac{1}{2}$ lb. bonemeal.

After this time the laying ration can be gradually worked in. The laying ration is made up of 200 lbs. ground oats, 100 lbs. ground corn, 100 lbs. tankage (60 per cent protein) or high grade meat meal.

TOMATO JUICE FOR LEG WEAKNESS

TOMATO JUICE added to the chick's ration will cure the "rickety" or weak-legged chickens, Prof. E. C. Foreman, head of the poultry department of the Michigan agricultural college, has informed poultrymen of his state.

"This was demonstrated this past year," he said, "with a flock of early hatched Barred Rock chicks at the Michigan agricultural college. A brood of nine chicks from our 302-egg hen were hatched the latter part of January. They developed rapidly until they were ten days old, when

suddenly a reaction was noticed. The green food had been neglected in their ration with the result that one died, another would frequently go into convulsions and the balance of them showed signs of leg weakness. Tomato juice was administered with exceptional results. In less than 24 hours every chick showed improvement and today all are thriving and healthy.

"The Ontario agricultural college has conducted an extensive experiment on the relative value of tomato juice in reducing the mortality among chicks and promoting growth. During March 2,000 chicks were hatched and placed in this experiment. Careful records of weights attained at successive periods during the growing period were registered and it was found that growth of this lot was 13 per cent above the normal growth curve.

"This increase in growth rate, of course, was most gratifying, but there still remained the more important results that mortality was practically wiped out and no case of leg weakness or drooping wings developed."

ROUND WORMS IN POULTRY

WHEN a fowl develops a depraved appetite it is a pretty good indication of the presence of worms, according to Professor H. E. Cosby, specialist of the Oregon Agricultural College.

A bird so afflicted will be seen eating manure, sticks, etc. Shriveling of the comb and gradual loss of flesh is another indication. Often the bird limps, or her wings drop down.

The round worm in poultry is continually laying microscopic eggs which are passed in the bird's droppings and are extremely hard to destroy. The common angleworm enjoys them as food, and in this intermediate host the eggs go through partial development. The hen or chicken eats the angle worm and six or eight weeks later there is a new crop of round worms, lowering the vitality of the birds and possibly affecting their breeding qualities.

For round worms, the following treatment is recommended, though authorities are far from being agreed that it is always effective. To every 100 pounds of mash fed the birds, add two pounds of powdered tobacco, such as may be obtained at any drug store. Keep up the treatment for three of four weeks, twice each year, or 10 days to two weeks, four times each year.

CAUSE OF SOFT-SHELLED EGGS

SOFT SHELLED eggs are caused by an irritation of the egg passage, hurrying the egg along before it has had time to get the shell formation. Over stimulation, by feeding too highly seasoned foods aided by egg condiments, are usually the cause of the soft shell, although it may be due to a lack of shell forming material, and can be supplied by feeding crushed oyster shell or old plaster. It does not pay to run any machine to the limit of time, and this is especially true with the egg machine. Whenever you begin to crowd the capacity there will soon be something deficient. Feed good wholesome foods in moderation with but little if any stimulant and an abundance of green stuff at all times.

VITAMINES are as essential for proper nourishment and development of chickens and other poultry as for human beings. For the fowls the source of these must largely be milk and the common green foods.

DRIED BLOOD is not desirable for feeding in a poultry ration. The blood should be fed as fresh as possible.

WHEN buying fish meal for the poultry flock, care should be taken to get the feed and not the fertilizer. Fish meal that has been prepared for a fertilizer is very apt to cause protein poisoning.

Bees and Beekeeping

Edited by AMOS BURHANS

INCREASING THE DEMAND FOR HONEY

I BELIEVE that ultimately, honey, like other foodstuffs, will be marketed through the retail grocers, says E. S. Miller in the *American Bee Journal*. During the last few months, more honey has been distributed than ever before in the same length of time, largely through roadside sales to tourists and by house-to-house canvassing. House-to-house selling disposes of a large amount of honey at times, but this practice tends to kill the market, for the reason that where canvassers fill up a town or a portion of a large city, grocers refuse to handle this line of goods. The result is that when the honey sold is consumed, no more can be obtained until the canvasser returns, perhaps several months or a year later. In order to create a permanent demand for honey there must be a constant supply, which can be had only through permanent dealers in foods. Then, again, canvassers often dispose of an inferior grade of honey purchased at a low price and sold at an exorbitant figure. In fact, the margin must be large in order to make this mode of marketing profitable. These things tend to discourage the consumer from again buying at any price. Then, to further demoralize the market, there is the farmer beekeeper who frequently peddles his surplus at a ridiculously low price, often retailing it at less than wholesale market price and less than the cost of production. It is no wonder that the grocer becomes disgusted and refuses to handle honey. There is no doubt that far more honey could be sold were we to let the retail dealer do the distributing and advertise the fact that he sells our product.

In order to create a permanent demand there must be not only a constant supply but there also must be publicity through advertising. The advertising should be local, state and national. Assuming that there is no co-operative marketing agency in the field, every honey producer who is near a potential market should advertise constantly in his local papers, and when his crop is disposed of he should buy from other producers. A given territory advertised thoroughly is more productive of results than is a large area covered and worked spasmodically. In advertising, the matter should be changed frequently. One should aim to make it interesting and instructive. It should give, each time, some new item of information concerning honey and its delicious qualities as a food. I do not think we gain much by emphasizing the use of honey in cooking. It is better without cooking; besides, people are apt to get the notion that it is good for nothing else.

Where there is no producers' marketing agency, it is very probable that many state organizations could profitably carry on a campaign of advertising. It could be financed by listing the names of producers who are willing to pay and to comply with certain requirements. The names could be listed directly in the advertisement or in circulars sent to prospective purchasers.

BUT TO create a state or local market alone is not sufficient, for if this is done, there is nothing to prevent outside honey from coming in and underselling our product. What is needed is an increased demand in every state, resulting in better market conditions as a whole. To meet this requirement there was organized the American Honey Producers' League, with its scheme of national advertising. I believe that it is to the commercial advantage as well as the duty of every producer to give full moral and financial support to this organization. Its success will be measured by the support it receives from its membership, and we cannot afford to let it languish for want of funds. By cooperation and united efforts the American Honey Producers' League,

with its various activities, can be made the most effective instrument for the advancement of bee-keeping interests that has yet been brought forth. Let us put aside petty jealousies and let every state cooperate with the National League to the end that the interests of the whole industry may be advanced.

LESSENING POISON DANGER

By A. W. MOORE

MEASURES may be taken by the fruit grower to lessen the danger of poisoning bees by spray, reports H. A. Scullen, bee specialist at the Oregon Agricultural College.

"Lack of nectar secreting plants during the codling moth spray periods is probably the main cause of spray poisoning of bees," says Mr. Scullen. "This is substantiated by the fact that very little damage is done in western Oregon and western Washington, where other flora is in bloom during these spray periods."

Losses are more evident when the air is humid and may be traced to three sources—the bloom of the apple, blooming cover crops under the tree, and moist spray on the foliage of the tree and underlying vegetation, according to Mr. Scullen.

Many instances have been noted where aparies have been completely depleted, while others have failed to do more than actually survive. Symptoms of spray poisoning seem to be especially noticeable in the morning when the dew is still on the plants. Sluggish and paralyzed condition, distended bodies, a general inability to fly—these stages, generally followed by death, are indications of spray poisoning when occurring during the spraying season. Many of the field bees are doubtless killed before they reach the hives. The brood is also affected by direct poisoning or neglect due to the poisoning of the nurse bees. Some instances are reported of the queens being poisoned.

Of the aparies affected the majority are usually within a half mile of the orchards and the greatest distance appears to be about two miles. Instances are noted, however, of colonies being in an orchard and escaping damage.

The honey bee is one of the fruit growers' best friends and the bee man needs the orchards for pasture. Cooperation is therefore essential to the best interests of both.

Use of some repellent has been suggested. Since it would be necessary to have a substance which would repel the bee and at the same time be taken by the codling moth, a difficult problem is presented. There would also be the difficulty in getting the orchardist to use the repellent in the spray.

Where the calyx spray is applied at the end of the bloom period there seems to be little trouble except in the case of some irregular blooming varieties such as the Rome Beauty. Since the cover crop appears to be a factor, it is possible that by cutting or discing the crop in, much of the trouble from this source may be avoided.

The bee man may help himself by feeding the bees if poisoning takes place at a time when there is a lack of nectar bearing flowers. It is also suggested that the bees be moved to a distance greater than two miles from the orchard before spraying begins. This is a costly undertaking and is not recommended except as a last resort.

That the fruit grower should do all within his power to protect the bees which are so necessary to him in pollination is the belief of the bee man. Nature makes the bee man a cooperator and it is thought that the fruit grower should realize his obligation.

AROUND June 1 the peach growers of Sutter county were paying \$4 a day to the men engaged in thinning the crop. This wage was probably a little higher than it would have been had not the demand for help been greater than the supply.



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